CHAPTER 2

AVIATION DEMAND FORECASTS

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2.1 INTRODUCTION AND BACKGROUND

A critical element in the planning and development of airport facilities is knowing the level of passengers, aircraft movements and cargo volumes that can be expected during a prescribed planning time period. This chapter discusses the projected activity levels for passengers, aircraft movements and air cargo that might be expected within the next 20 year planning horizon. It also describes the methodology used to estimate those volumes. The chapter concludes with recommended passenger and operations forecasts that will be used to plan the requirements for future infrastructure and facilities. The forecast is presented in five and ten year increments beginning with a base year of 2015 outward to 2020, 2025, and 2035.

Changes in passenger, cargo and aircraft movement volumes are known to be influenced by a variety of elements, including variations in population, labor force, per capita income, gross regional product, air fares, competition from other airports or modes of transportation, and a variety of other economic and non-economic factors, including airline business policies and local regulatory conditions.

The Federal Aviation Administration (FAA) annually prepares its Terminal Area Forecast (TAF) for 264 FAA towered airports, 252 federal contract tower airports, 31 terminal radar approach control facilities, and 2,818 non-towered airports. Eugene Airport (EUG) is one of these airports. For the purposes of this master plan update, the baseline forecasts for passenger, aircraft operations and based aircraft annual volumes that will be used in planning the various airport facilities will be based on the latest FAA TAF numbers.

In order to account for specific conditions that have transpired since preparation of the TAF, this chapter also includes alternative forecast scenarios for commercial passenger enplanements (i.e. the number of passengers boarding an aircraft) and aircraft operations (the number of take-offs and landings). Multiple scenario-based activity estimates were generated for each of these categories of commercial passenger aviation activity. Additionally, a preferred forecast scenario was selected and refined to determine peak hour activity, which will be used for facility planning.

2.2 HISTORICAL AVIATION ACTIVITY

Aviation activity at an airport is defined as the amount of aircraft operations by general aviation (GA), military, and commercial aircraft, and the number of passengers that use commercial air service for their transportation needs. This section describes the historical aviation activity data for EUG. The data is used to understand previous trends and patterns at the airport, their interrelationships with key economic indexes for the airport's catchment area, and is then used to build the forecast of future aviation activity.

2.2.1 Passenger Traffic

As shown in **TABLE 2-1**, during calendar years 2014 and 2015, EUG was the second busiest commercial airport in the State of Oregon and was ranked 124 among all commercial airports in the US in terms of the number of enplaned passengers, according to FAA's air traffic data for FY 2015.

TABLE 2-1
OREGON COMMERCIAL SERVICE AIRPORTS

Rank	Airport Identifier	Airport Name	Hub	CY 14 Enplanements	CY 15 Enplanements	% Change
30	PDX	Portland International	Large Hub	7,878,760	8,340,252	5.86%
124	EUG	Mahlon Sweet Field	Small Hub	440,198	447,813	1.73%
139	MFR	Rogue Valley International - Medford	Non-Hub	323,563	370,187	14.41%
160	RDM	Roberts Field	Non-Hub	255,654	280,823	9.84%
360	OTH	Southwest Oregon Regional	Non-Hub	15,080	16,207	7.47%
478	PDT	Eastern Oregon Regional at Pendleton	No Hub	4,015	4,277	6.53%

Source: FAA Passenger Boarding and All-Cargo Data for U.S. Airports, 2016

The passenger activity was achieved through air service provided by five airlines serving 10 non-stop destinations. **FIGURE 2-1** illustrates the current destinations served from EUG. Aircraft serving these routes include regional jet aircraft such as the Bombardier CRJ700/900 and the Embraer E175, narrow-body jets such as the Airbus A320 and Boeing B737, and prop-jet aircraft such as the Bombardier Q400.

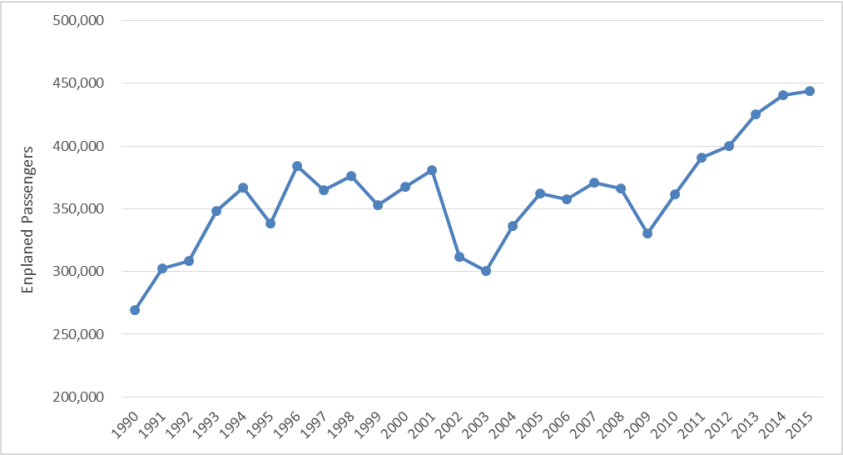
FIGURE 2-1
2015 DESTINATION MAP

Source: www.flyEugene.com. 2016

Airline routes, frequency, and associated enplanement volumes at EUG have fluctuated since 1990. Over the last seven years, enplanements have been increasing, and the Airport achieved a new record high number of passenger enplanements in 2015 when annual enplanements reached 448,140. In the last fifteen years, there have been two notable declines in enplanements. The first being the decline between 2001 and 2003, which was attributed to the nation-wide decline in air travel after the terrorist events of September 11, 2001 and the resulting economic recession. The second more recent decline was from 2007 to 2009, which was associated with the 2008 recession. The negative results of both of these events were widespread, affecting air transportation activity throughout the nation and were not isolated to EUG.

After both recessions, passenger enplanements rebounded. Since 2009, the airport averaged a five percent growth rate year over year. In 2011, the airport reached 390,964 annual enplanements, breaking its previous record of 384,083 annual enplanements set in 1996. Since then, a new record high has been reached every year to date. The airport's historical annual passenger enplanements are shown in **FIGURE 2-2** and **TABLE 2-2.**

FIGURE 2-2
HISTORICAL PASSENGER ENPLANEMENTS



Source: FAA 2015 TAF Report
Notes: Preliminary FAA 2016 TAF data was used to determine total passenger enplanements in fiscal year 2015

TABLE 2-2
HISTORICAL PASSENGER ENPLANEMENTS

Year	Total Enplanements	Annual Increase /Decrease
1990	269,414	
1991	302,166	12.2%
1992	308,242	2.0%
1993	348,106	12.9%
1994	366,549	5.3%
1995	337,984	-7.8%
1996	384,083	13.6%
1997	365,007	-5.0%
1998	375,855	3.0%
1999	352,636	-6.2%
2000	367,543	4.2%
2001	381,062	3.7%
2002	311,560	-18.2%
2003	300,405	-3.6%
2004	336,044	11.9%
2005	362,335	7.8%
2006	357,267	-1.4%
2007	371,089	3.9%
2008	365,893	-1.4%
2009	330,382	-9.7%
2010	361,696	9.5%
2011	390,964	8.1%
2012	400,239	2.4%
2013	425,198	6.2%
2014	440,373	3.6%
2015	444,099	0.8%

Source: FAA 2015 TAF Report
Notes: Preliminary FAA 2016 TAF data was used to determine total passenger enplanements in fiscal year 2015

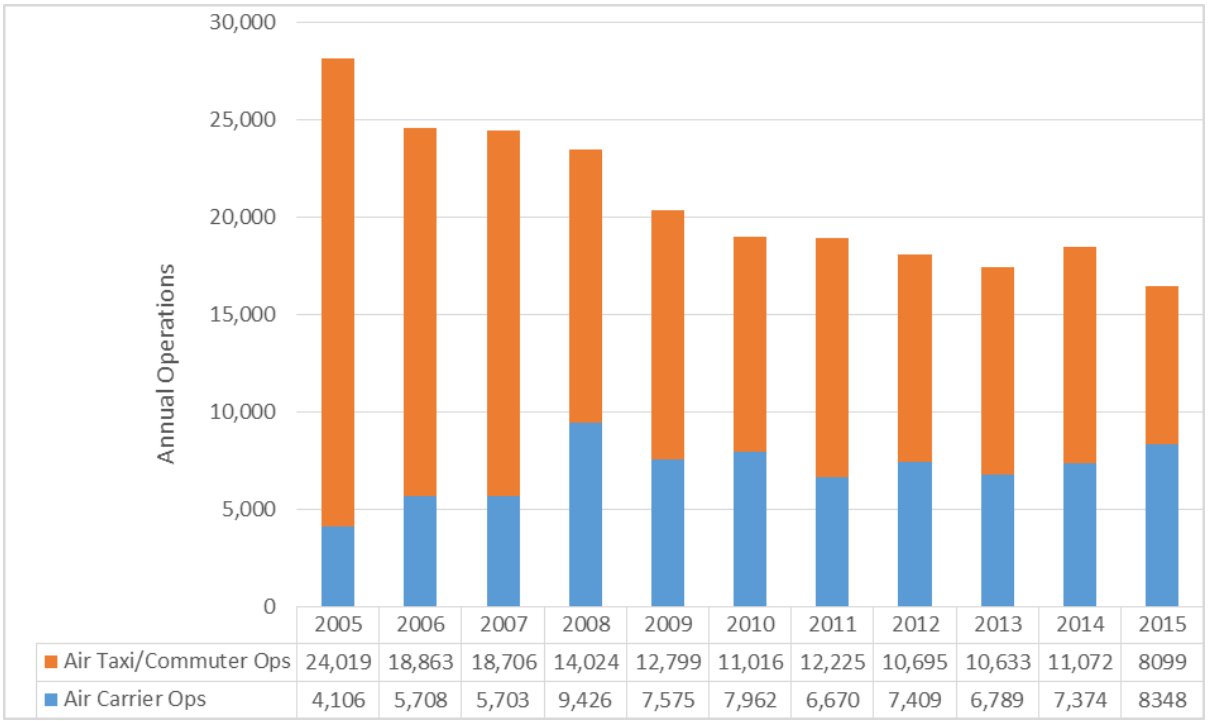
The airlines currently serving Eugene Airport include Alaska, Allegiant, American, Delta and United. Frontier Airlines had previously served EUG between 2013 and 2014, but withdrew from the market as a result of the airline restructuring its business model post-bankruptcy to become a low cost carrier. Frontier's entry into EUG was notable in that it was the second time the Eugene Airport saw regular bi- or triweekly flights using narrow-body aircraft since 2003[1]. The first time was when United Airlines brought narrow-body aircraft to EUG for a six month run in 2008. Allegiant began service in 2007 using MD80 aircraft, and now also uses A319/A320 aircraft. In June 2016, daily scheduled service on narrow-body aircraft returned to EUG with United Airlines service to DEN and SFO using A319/A320 aircraft. This up-gauge in aircraft is in-step with industry trends of airlines moving away from regional jets, reducing capacity, and up-gauging aircraft.

2.2.2 Aircraft Movements

Aircraft movements, also called operations, are defined as either a takeoff or a landing by an aircraft. This sub-section details the number of historical operations related to commercial passenger aircraft and general aviation aircraft. Additionally, because the number of commercial operations are directly influenced by passenger enplanement volumes, historical enplanement levels were examined to further understand trends in commercial operations at EUG.

Commercial aircraft movements have declined since 2005, with a loss of approximately 34 percent. **FIGURE 2-3** shows a breakdown of these operations between 2005 and 2015.

FIGURE 2-3
AIR CARRIER AND AIR TAXI OPERATIONS (2005-2015)



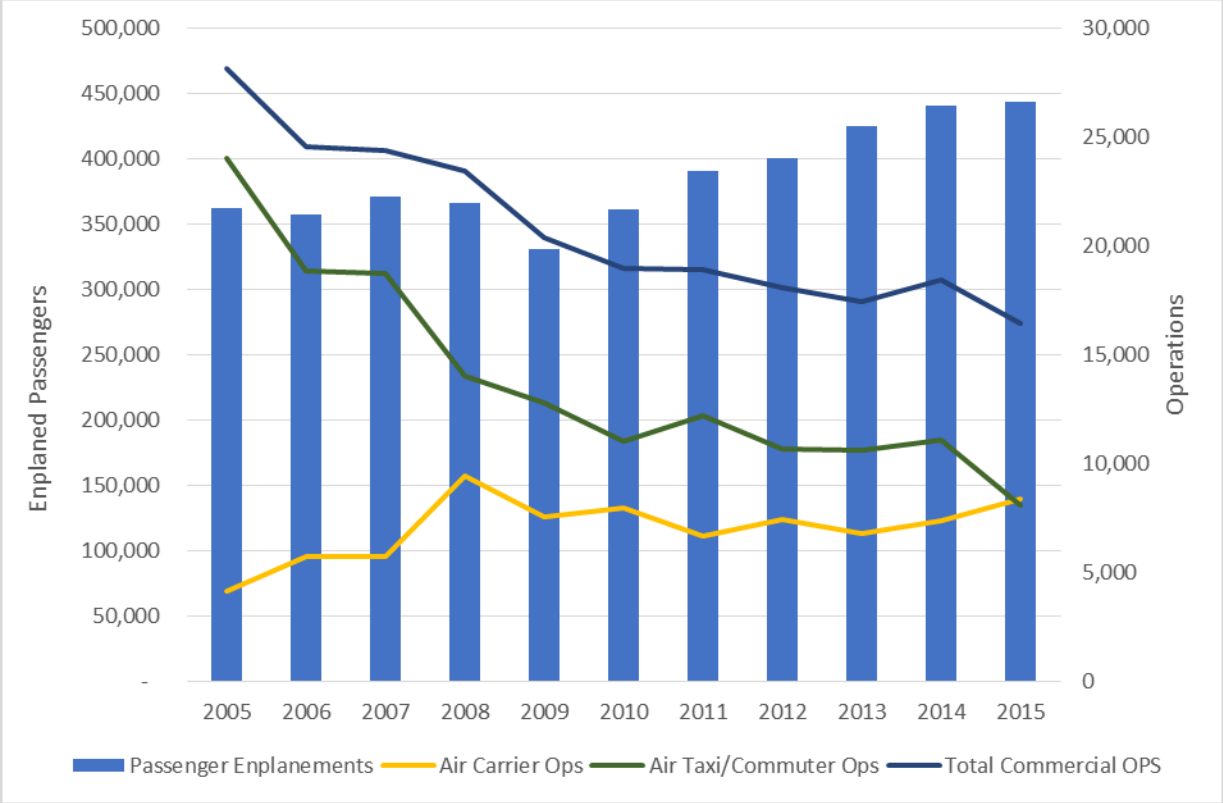
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Air Taxi/Commuter Ops	24,019	18,863	18,706	14,024	12,799	11,016	12,225	10,695	10,633	11,072	8099
Air Carrier Ops	4,106	5,708	5,703	9,426	7,575	7,962	6,670	7,409	6,789	7,374	8348

Source: FAA 2015 TAF Report
Notes: OPSNET data was used to determine operations in fiscal year 2015

[1] 2010 Eugene Airport Master Plan

It was noted that while total commercial operations have declined, air carrier operations have been rising since 2013. Similarly, passenger enplanement levels have increased by 24 percent between 2005 and 2016 as shown in **FIGURE 2-4**. This is a direct result of the increased usage of larger aircraft that provide higher seat capacity with fewer operations. The table illustrates this phenomena, especially since 2014 where an increase in air carrier operations and decrease in air taxi operations is easily observed. This is a trend being seen across the U.S. as airlines are up-gauging aircraft from regional jets to narrow-body aircraft.

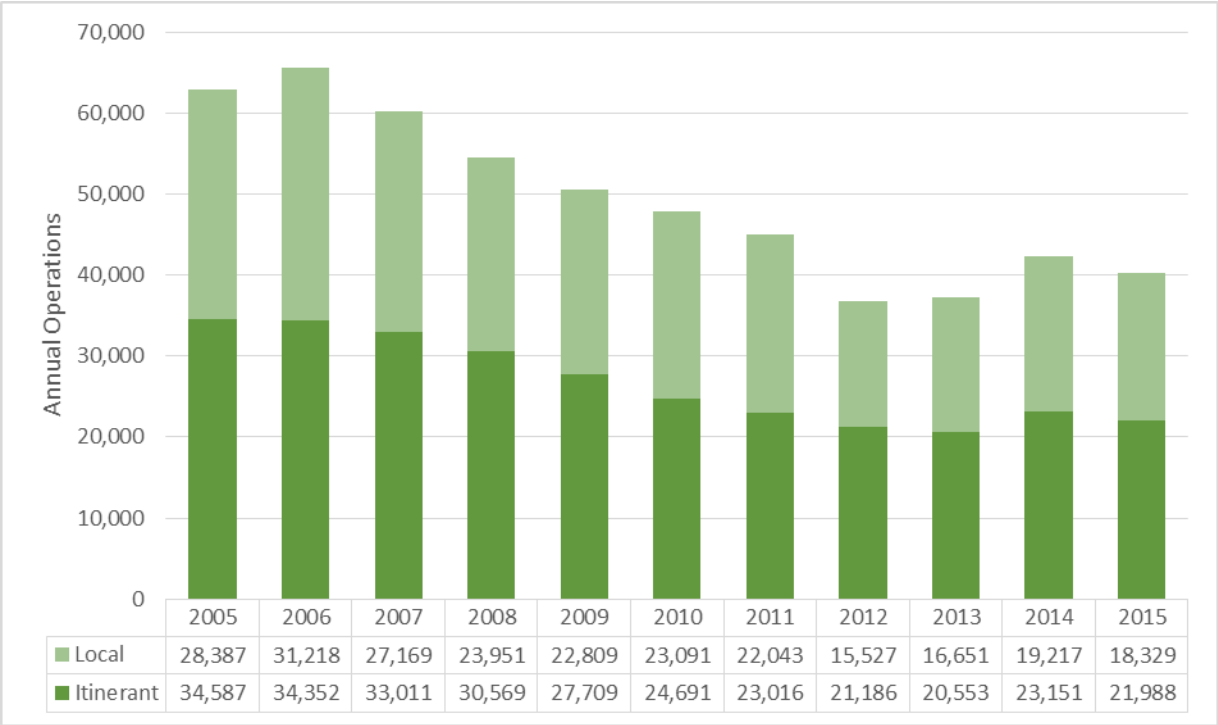
FIGURE 2-4
HISTORICAL PASSENGER ENPLANEMENTS AND COMMERCIAL OPERATIONS



Source: FAA 2015 TAF Report
Notes: OPSNET data was used to determine operations in fiscal year 2015
Preliminary FAA 2016 TAF data was used to determine total passenger enplanements in fiscal year 2015

In contrast to commercial operations, general aviation (GA) operations at EUG have declined approximately 33 percent since 2005, as shown in **FIGURE 2-5**. Comparably, other airports in the state such as Medford, Redmond, and Corvallis airports also experienced decreases in total GA operations between 2005 and 2014. GA declines now appear to be stabilizing as the majority of decline took place between 2007 and 2012. The declines at EUG are in line with national trends, which saw a decrease in general aviation operations since the 2008 recession.

FIGURE 2-5
GENERAL AVIATION OPERATIONS (2005-2015)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Local	28,387	31,218	27,169	23,951	22,809	23,091	22,043	15,527	16,651	19,217	18,329
Itinerant	34,587	34,352	33,011	30,569	27,709	24,691	23,016	21,186	20,553	23,151	21,988

Source: FAA 2015 TAF Report, OPSNET, 2016

During conversations with staff from Lane Aviation Academy, it was noted that approximately 20 to 30 percent of the local GA operations at EUG are conducted by student pilots training at Lane Aviation. Any increases or decreases in student training levels can greatly affect the airport's total number of local GA operations. In regard to itinerant GA operations, it was noted during discussions with airport businesses that EUG sees a minimal amount of transient GA activity by small piston type aircraft. This was described as being partially due to the lack of convenient walking accessibility between GA transient parking and the airport's landside restaurant in the terminal building and other amenities. Thus it was concluded that the majority of itinerant GA operations are conducted by business jet and turbo-prop aircraft.

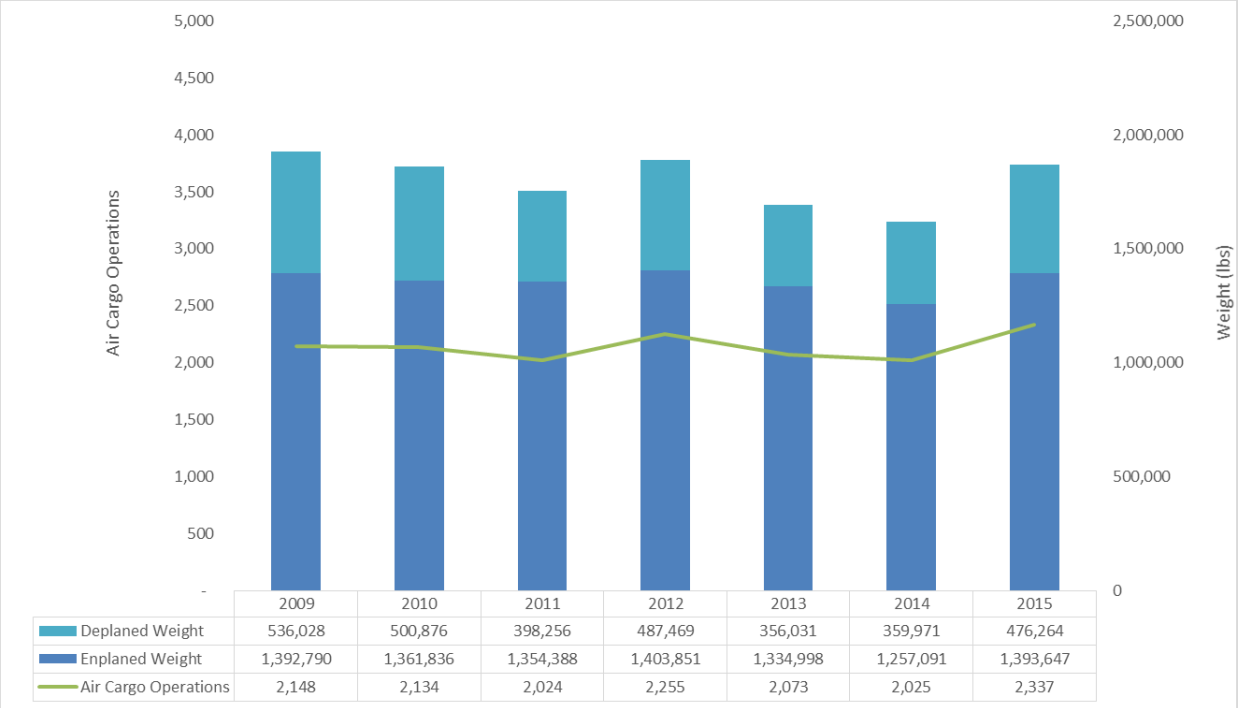
2.2.3 Air Cargo Activity

Three all cargo airlines serve EUG which transport roughly 80 to 90 percent of all cargo at the airport. These include AmeriFlight, Empire Airlines, and Martinaire Aviation. These airlines primarily operate feeder flights for package delivery services for UPS and FedEx. Aircraft being used by these operators include Cessna 208s, Piper PA-31s, Beechcraft 1900s, and Fairchild Metroliners. The remaining cargo is transported as belly cargo by Horizon Air which often handles perishable goods such as mushrooms, flowers, and fish. Annual cargo operations have been relatively flat, averaging just over 1,000 operations per year over the last five years. Likewise, enplaned weight has plateaued around 1,350,000 pounds per year. **FIGURE 2-6** shows annual cargo operations and enplaned weight from 2010 to 2015.

Flight schedules for the three cargo operators are very similar. Martinaire flies once a day, Monday through Friday. Martinaire's Cessna 208 arrives from Roberts Field in Redmond Oregon in the morning, and departs in the afternoon to Portland International (PDX). Empire Airlines flies two Cessna Caravans a day to Eugene. Both aircraft are on the ground around 4:00 PM local time. The two aircraft arrive from PDX and then depart to Roseburg Regional Airport (RBG). Ameriflight flies Monday through Thursday, and on Saturdays. Their Piper PA-31 is used on evening flights Monday through Thursday, and a Beech 99 is

used on Saturday mornings. The PA-31 arrives from RBG and departs to PDX, and the Beech 99 arrives from PDX and departs to RBG. All three cargo operators have had the same flight schedule for a number of years with no indication of change.

FIGURE 2-6
HISTORICAL AIR CARGO DATA



	2009	2010	2011	2012	2013	2014	2015
Deplaned Weight	536,028	500,876	398,256	487,469	356,031	359,971	476,264
Enplaned Weight	1,392,790	1,361,836	1,354,388	1,403,851	1,334,998	1,257,091	1,393,647
Air Cargo Operations	2,148	2,134	2,024	2,255	2,073	2,025	2,337

Source: Bureau of Transportation Statistics, Airport Records, 2016
* Operations prior to 2015 extrapolated based on 2015 ratio of cargo operations and enplaned cargo

During the analysis of historical air cargo data, a significant difference in enplaned versus deplaned cargo weight was identified. Roughly three to four times more air cargo is enplaned in EUG than deplaned. This variation is attributed to Eugene's close proximity to Portland. With Portland, and Portland International Airport (PDX) being the major cargo centers in the region, nearly all cargo is flown into Portland before being dispersed to outlying regions. Consequently, most air cargo entering the region is first flown into Portland and then transported by truck to Eugene and Lane County. This is because the markets are relatively close and the cost of truck transportation between the areas is low. Additionally, there is limited cargo capacity flying from EUG to PDX since the size of aircraft flying to PDX by air cargo operators is very small and there is little belly-hold capacity in the small turboprops aircraft such as the Q400 and EMB175 being flown by passenger carriers As such, large air cargo domestic items that originate or terminate in Eugene are primarily transported by truck to/from PDX. In contrast, if cargo is flown to/from international markets, the cargo may be trucked as far as Seattle or San Francisco.

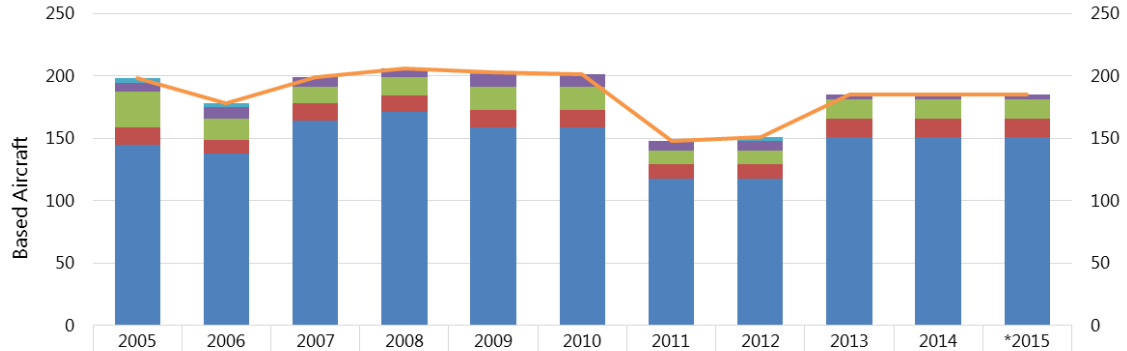
During interviews with the air cargo operators at EUG, it was not determined what type of cargo is being enplaned, as that information is confidential. However, an overall assessment of the conditions at EUG leads to a conclusion that high value, light weight products are the majority of those being shipped out of Eugene via aircraft. Because the fleet mix and the carrying contracts that the cargo operators hold with UPS and FedEx limit the amount of cargo that can be carried per flight operation, manufacturers of heavy/large items are not able to ship their products from EUG as air cargo. Eugene's largest industries include those related to health care, social assistance, and manufacturing of heavy items, which are all

unlikely to use air cargo services to ship regular quantities of cargo out from EUG. In contrast, with the large number of technology companies in the area, it is assumed that some high value, light weight products are being manufactured and shipped out of Eugene regularly.

2.2.4 Based Aircraft

Based aircraft represent the total number of active, civil aircraft permanently located at an airport. Based aircraft categories include single-engine, multi-engine, jet, helicopter, and other. Historical based aircraft data between 2005 and 2014 as recorded in the FAA TAF is presented in **FIGURE 2-7.** The 2015 data was obtained from the most recent Airport 5010 Master Record. The 5010 Master Record and the FAA TAF data are typically the same, as the TAF pulls its data from the 5010.

FIGURE 2-7
HISTORICAL EUG BASED AIRCRAFT



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	*2015
Other	4	3	0	0	2	0	0	3	0	0	0
Helicopter	7	9	8	7	10	10	8	8	4	4	4
Jet	28	17	13	15	18	18	11	11	15	15	15
Multi-Engine	14	11	14	13	14	14	11	11	15	15	15
Single-Engine	145	138	164	171	159	159	118	118	151	151	151
Total	198	178	199	206	203	201	148	151	185	185	185

Sources: FAA 2015 TAF Report
* Data is from Airport 5010 Master Record

Airport administration records were examined for the forecast analysis, which includes data obtained through surveys sent out in 2016 to hangar owners who hold ground leases with the City of Eugene Airport Division. The survey is estimated to have had about a 60 to 80 percent response rate, and were dependent on hangar owners accounting for aircraft in all of the hangar units they owned. Because the airport administration doesn't directly manage or maintain any of the hangar units at the airport, no other convenient means of tracking aircraft in hangar units is available. Thus, the accuracy of both airport administrative data and TAF data is expected to have some variance from the number of existing based aircraft.

It was noted in the 2016 survey that the majority of non-responders appeared to come from the single-engine owner category. Business aircraft owners/lessees had a much higher response rate, and thus this data is deemed to be more accurate. The results of the 2016 survey are shown below in **TABLE 2-3.** The total based aircraft of 156 is 29 less aircraft than the 2015 5010 Master Record indicated. Additionally, there were 5 less multi-engine and 2 more jet engine aircraft reported in the survey as compared to the 5010 Record. These factors were taken into consideration in the forecast section of this chapter. Further discussion of the analysis is provided in **Section 2.4.4**.

TABLE 2-3
EUGENE AIRPORT 2016 BASED AIRCRAFT SURVEY RESULTS

Forecast Year	Single Engine	Jet	Multi-Engine	Helicopter	Other	Total
5010 Master Record	152	15	15	4	0	186
2016 Based Aircraft Survey	119	17	10	3	7	156

Source: FAA 2016 5010 Master Record, Eugene Based Aircraft Survey (July 2016)

2.3 DEMOGRAPHIC, ECONOMIC, AND GEOGRAPHIC OVERVIEW

Usage of an airport is directly related to the economic activity of a region, the airport's location and proximity to populated areas, and the demographic characteristics of those populated areas. This section provides details on these topics as they relate to EUG.

2.3.1 Geographic Attributes

EUG is located in the southern portion of the Willamette River Valley, which is the area that runs from the Columbia River adjacent to Portland down to Eugene. **FIGURE 2-8** below illustrates the geography and population density in the region surrounding Eugene. The lighter areas represent lower density, while orange areas represent higher density. As shown, the majority of the area's population is within the Willamette River Valley corridor, starting in Portland and extending south to Eugene. The dashed blue line represents the EUG catchment area, which encompasses 91 zip codes and had an estimated total population of roughly 730,000 in 2014.[2]

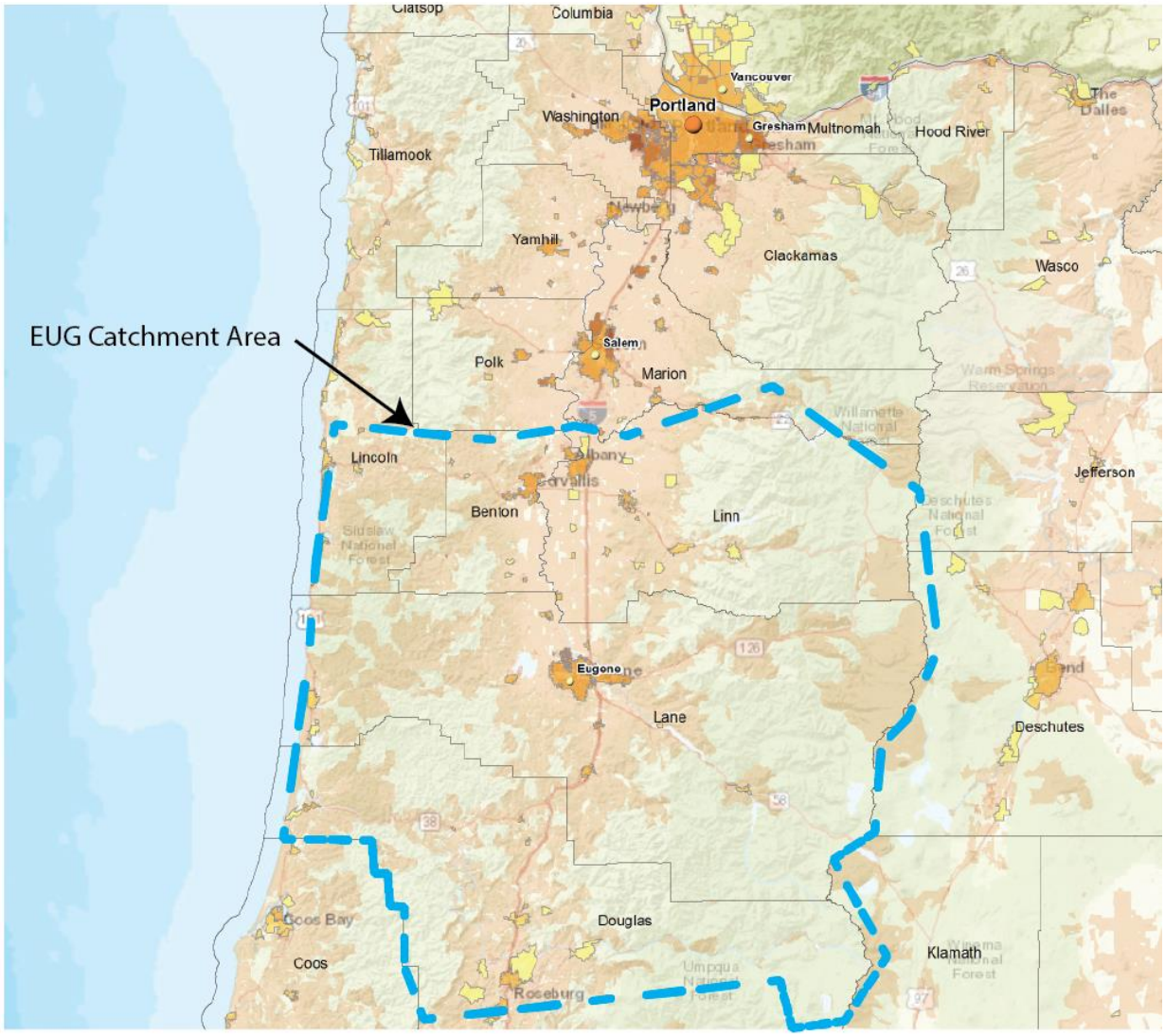
The catchment area represents the area that is deemed reasonable, based on drive times and convenience, to draw passengers to the airport. The catchment area extends north to the southern tip of Marion and Polk County, and to the south into Coos and Douglas Counties.

The catchment area is essentially the area available to an airport and their airline partners to attract passengers. Passengers choose an airport based on a wide variety of factors, including destinations offered, airlines, airline connectivity, flight schedules, ticket price, proximity, ease of use and convenience, and parking fees. The closest option for air travel to Eugene area residents is Portland International Airport (PDX), which offers an extensive network of destinations and routes by numerous airlines and is located 129 miles away. At this distance, it can take area residents between two and three hours to drive from Eugene to Portland.

With EUG offering less expensive parking and competitive fares, many travelers in Eugene, as well as the outer areas of the northern portion of the catchment area are choosing to fly from EUG. Travelers in the southern portions of the catchment area have a choice to fly from airports in North Bend, Medford, or Eugene. With EUG being the second largest commercial service airport in Oregon, passengers are afforded more airline selection and more destination routes than other airports in the southern regions of the catchment area. Thus, many travelers drive north to Eugene to fly from EUG.

[2] Eugene Airport Passenger Demand Analysis, Mead and Hunt, 2014

FIGURE 2-8
EUG CATCHMENT AREA



Source: Esri and GIS User Community, Eugene Airport Passenger Demand Analysis Report, 2014

2.3.2 Demographic Characteristics

TABLE 2-4 presents a comparison of population growth within the counties that are included within EUG's catchment area. There is only one metropolitan statistical area (MSA) included in the EUG catchment area, which is made up of all residents within Lane County. Lane County is the largest county of those compared, and has seen a compounded annual growth rate (CAGR) of 0.8 percent between 2005 and 2015. The total combined CAGR of all the counties between 2005 and 2015 is 0.7 percent, which is less than the State of Oregon and the United States CAGR for the same period.

TABLE 2-4
HISTORICAL POPULATION GROWTH COMPARISON

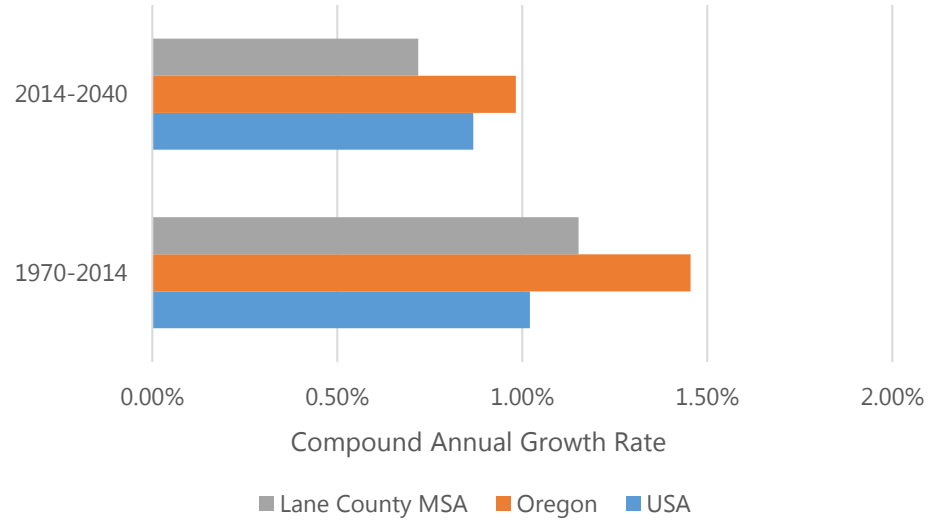
County	Census Population						CAGR 2005-2015
	2005	2011	2012	2013	2014	2015	
Lane County*	335,831	353,637	354,610	355,650	358,506	362,895	0.8%
Benton County	80,943	86,025	86,441	86,024	86,414	87,572	0.8%
Linn County	108,132	118,137	118,359	118,545	119,269	120,547	1.1%
Douglas County	105,285	107,273	107,127	106,887	106,998	107,685	0.2%
Lincoln County	45,347	45,854	46,166	46,291	46,386	47,038	0.4%
Total MSA	**335,831**	**353,637**	**354,610**	**355,650**	**358,506**	**362,895**	**0.8%**
CAGR YOY (MSA)			0.3%	0.3%	0.8%	1.2%	
Total Combined**	**675,538**	**710,926**	**712,703**	**713,397**	**717,573**	**725,737**	**0.7%**
CAGR Combined (YOY)			-0.2%	-0.1%	-0.6%	-1.1%	
Oregon	3,613,202	3,868,509	3,899,444	3,928,030	3,971,202	4,028,977	1.2%
CAGR (YOY)			0.8%	0.7%	1.1%	1.5%	
United States	295,516,599	311,721,632	314,112,078	316,497,531	318,857,056	321,364,129	0.9%
CAGR (YOY)			0.8%	0.8%	0.7%	0.8%	

Source: Census Data, 2016
*Counties included in the MSA. **Combination of Lane, Benton, Linn, Douglas, and Lincoln

Current and future population projections associated with the airport's metropolitan statistical area (MSA) were examined and compared to Oregon and the U.S. One of the leading objective sources for assessing market growth in the U.S. is Woods and Poole. The 2016 Woods and Poole data were used to provide forecasted information on population, as shown in **FIGURE 2-9**. Lane County and Oregon's population growth have historically been outpacing the US average population growth rate. However, it is projected by Woods and Poole that growth in Lane County and Oregon will slow between 2014 and 2040. Although the population rate of growth is expected to lessen in the future, the slower forecasted rate of growth indicates a stronger, more stable economy for the area.

Overall, the picture derived from the examination of the historical and future population forecasts for Lane County and the other counties in the catchment area, present a positive outlook for the area and EUG.

FIGURE 2-9
HISTORICAL AND FORECAST POPULATION GROWTH RATES



Source: Woods and Poole Data, 2016; RS&H Analysis, 2016

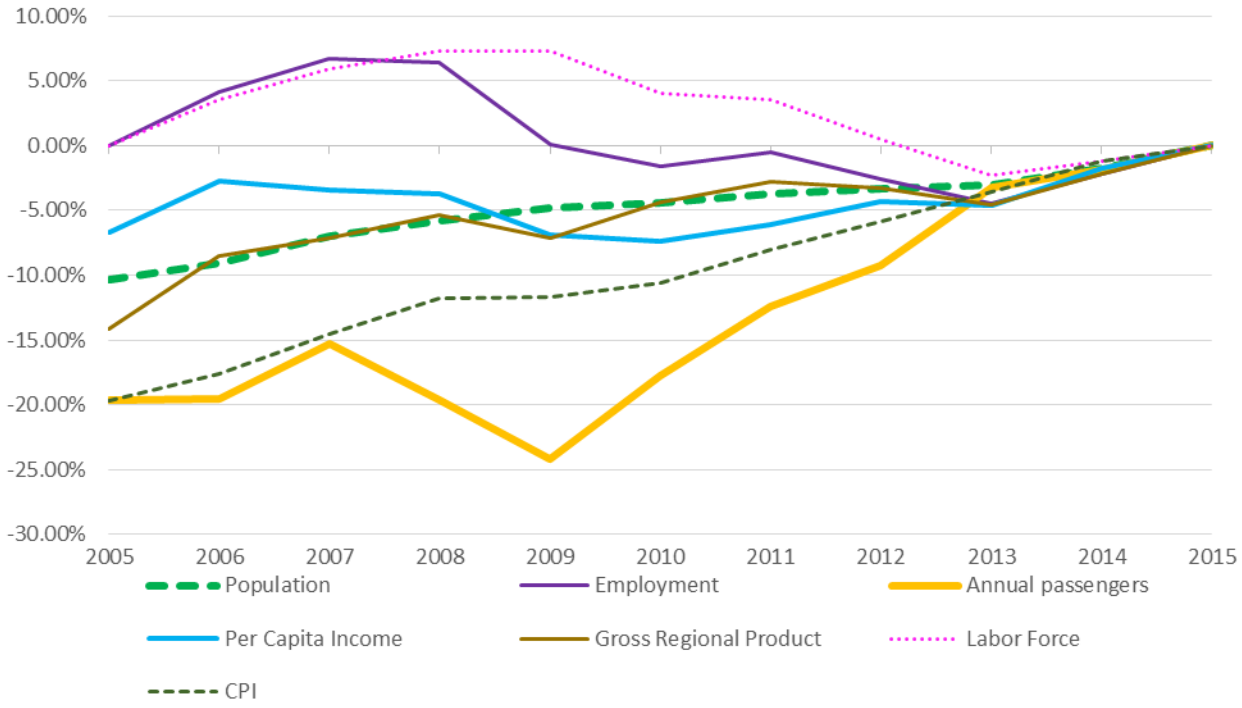
2.3.3 Economic Characteristics

FIGURE 2-10 represents the variation in key relevant economic index values from 2005 through 2015 for the City of Eugene, using 2015 as the index benchmark. The variation in economic indexes shown in the figure includes changes in:

- Population
- Labor force
- Employment
- Per capita income
- Consumer Price Index (CPI)
- Gross regional product
- Passenger volume at EUG

In analyzing the variation trends of the key economic indexes shown in **FIGURE 2-10** with the variation in enplaned passengers for EUG it is evident that the variation in per capita income and gross regional product follow a similar pattern of change. Statistical correlation analysis of enplaned passenger values with per capita income and gross regional product values yields coefficients of determination (R^2) of 0.895 and 0.917 respectively, indicating a close statistical correlation between them. This close correlation tends to indicate that passenger travel at EUG is highly impacted by the economic well-being of the residents and industries in the airport's catchment area.

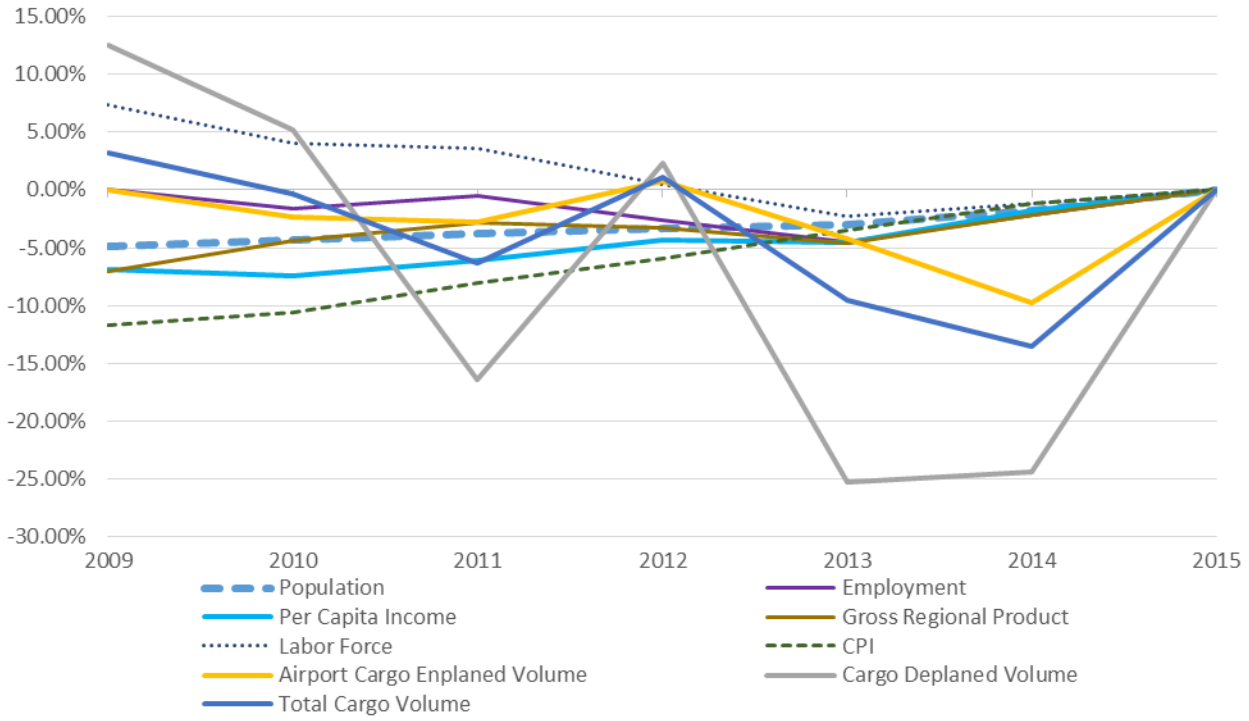
FIGURE 2-10
VARIATION OF KEY ECONOMIC INDEXES AND ANNUAL PASSENGER VOLUMES COMPARED TO 2015



Source: Airport Data, 2016 Woods and Poole, U.S. Bureau of Labor and Statistics, RS&H Analysis, 2016

The trends in the variation of deplaned, enplaned and total cargo volumes compared to the variation in key economic indexes presented in **FIGURE 2-11** does not show any similarities. Deplaned cargo shows major variations without similarities to the variation patterns of any of the key economic indexes of the region that would be able to explain the changes. Enplaned cargo has also experienced volatile variations for the past ten years, registering its highest volumes in 2015. Though, as with deplaned cargo, its variation patterns show no similarities to the variation patterns of any of the key economic indexes analyzed. Similarly, no statistical correlation of significant value was found between enplaned, deplaned or total cargo volume trends with any of the key economic indicators considered.

FIGURE 2-11
VARIATION OF KEY ECONOMIC INDEXES AND CARGO VOLUMES COMPARED TO 2015



Source: 2016 Woods and Poole, Bureau of Transportation Statistics, Airport Data U.S. Bureau of Labor and Statistics, RS&H Analysis

2.4 FORECASTS OF AVIATION ACTIVITY

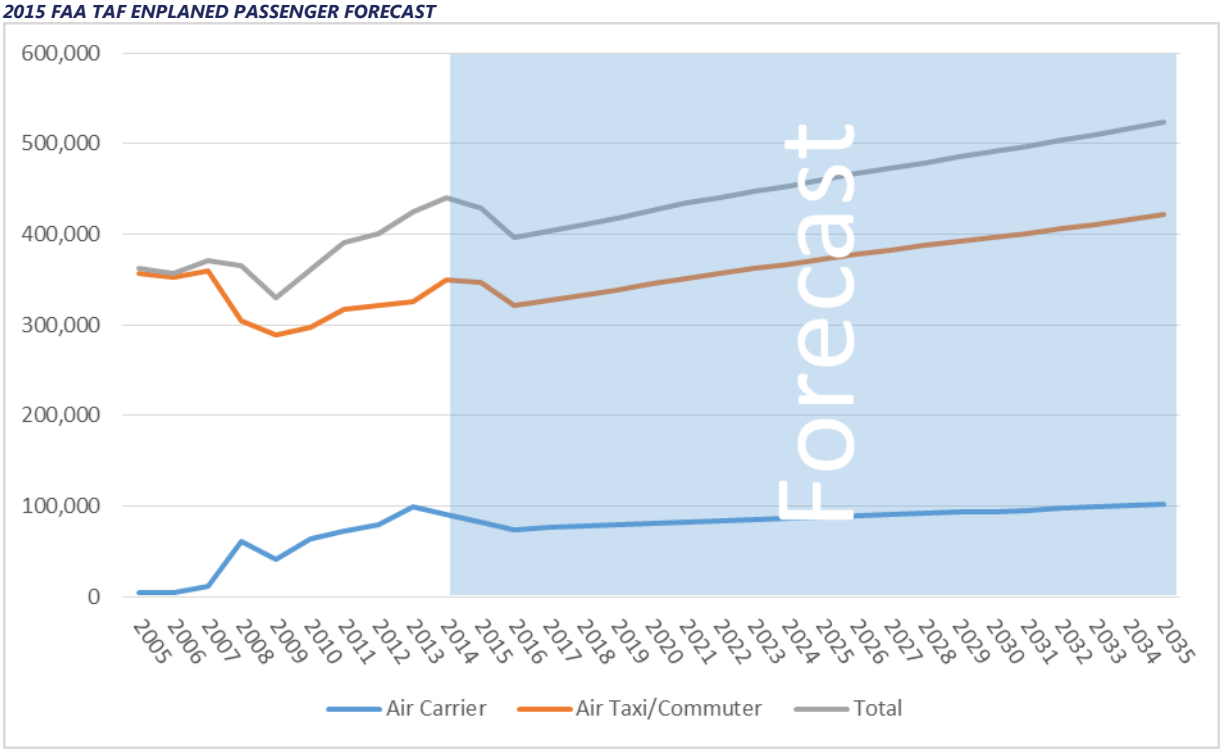
This section details the forecasts of aviation activity at EUG based on the FAA's Terminal Area Forecast (TAF) for commercial passenger enplanements and operations, general aviation operations, military operations, and based aircraft. Air cargo volumes and operations forecasts are also included in this section though these were prepared based on a historic trend analysis as FAA does not include air cargo forecasts in its TAF results.

2.4.1 2015 FAA Enplaned Passenger Forecasts

FAA's 2015 Terminal Area Forecast (TAF) for enplaned passengers at EUG for the 2015 to 2035 forecast period is provided in **FIGURE 2-12**. As observed, the TAF shows a slight decline in both air carrier and air taxi/commuter enplanements until 2016 and a steady increase in total passenger enplanements from 2017 to 2035 at a 1.48 percent annual growth rate. The FAA is expecting higher growth rates for passenger enplanements on air taxi and commuter aircraft than on air carriers.

A large inconsistency was identified in the 2015 TAF. That is, the decline forecasted in 2015 did not materialize. According to airport records, annual enplaned passengers actually exceeded 2014 numbers and set an all-time annual record.

FIGURE 2-12
2015 FAA TAF ENPLANED PASSENGER FORECAST



Source: FAA 2015 TAF Report

TABLE 2-5 below summarizes the volume of forecasted annual passenger enplanements from FAA's 2015 TAF report for 2015, 2020, 2025 and 2035, which are the increment years forecasted in this Master Plan.

TABLE 2-5
2015 FAA TAF ENPLANED PASSENGER FORECAST

Forecast Year	Annual Commercial Passenger Enplanements		
	Air Carrier	Air Taxi & Commuter	Total
2015	81,977	347,089	429,066
2020	80,733	345,529	426,262
2025	87,484	372,551	460,035
2035	102,035	421,938	523,973

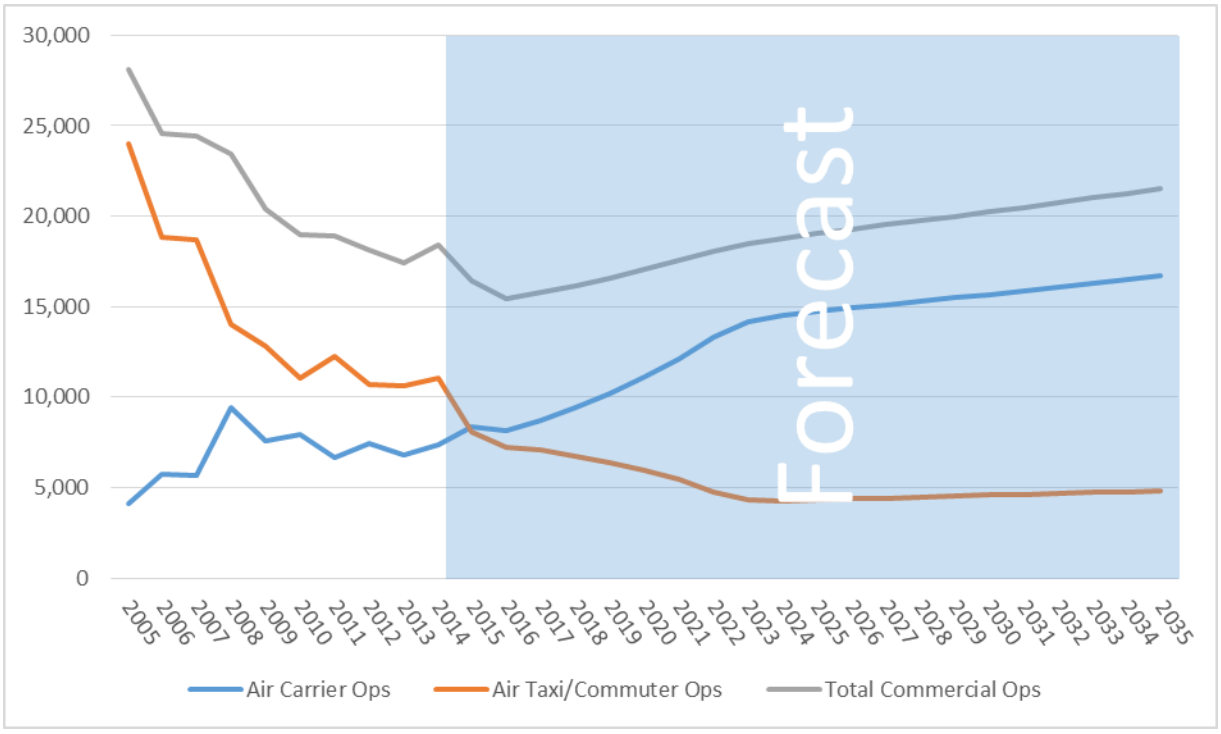
Source: FAA 2015 TAF Report

2.4.2 2015 FAA Commercial Aircraft Operations Forecasts

TAF forecast numbers shown in **FIGURE 2-13** indicate that FAA is expecting a steady growth in air carrier operations at EUG where air carriers are expecting to replace air taxi and commuter operations. The TAF shows a steady decline in air taxi/commuter operations until 2024 after which FAA is expecting a slight increase in their number of operations. Total commercial operations at EUG shows a decline until 2016 but an increase at a 2.64% annual growth rate until 2023 and 1.26% growth rate between 2024 and 2035.

TABLE 2-6 summarizes the volume of annual commercial operations from FAA's 2015 TAF report for the three planning increment years of the Master Plan.

FIGURE 2-13
2015 FAA TAF COMMERCIAL OPERATIONS FORECAST



Source: FAA 2015 TAF Report

TABLE 2-6
2015 FAA TAF COMMERCIAL OPERATIONS FORECAST

Forecast Year	Annual Commercial Operations		
	Air Carrier	Air Taxi & Commuter	Total
2015	8,348	8,099	16,447
2020	11,111	5,950	17,061
2025	14,700	4,325	19,025
2035	16,698	4,839	21,537

Source: FAA 2015 TAF Report

2.4.3 2015 FAA General Aviation and Military Operations Forecasts

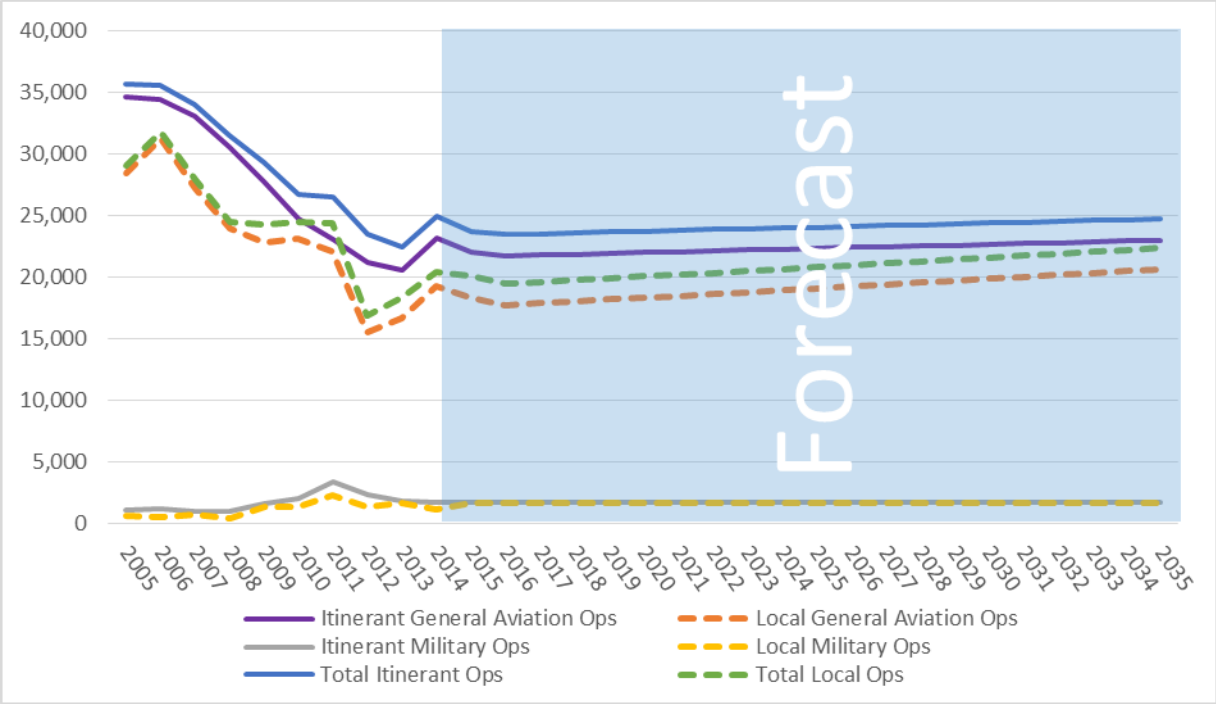
The FAA Aerospace Forecast 2016-2036 forecasts business aviation activity will drive growth in GA operations in the future. Piston aircraft activity is forecasted to continue a slow decline similar to what has been happing at a national level. FAA forecasts overall GA operations will increase nationally at 0.3 percent per year, with turbine powered activity increasing at a greater rate than the decline in piston aircraft operations.

FIGURE 2-14 shows the TAF for general aviation, military, and total operations. The TAF shows a decline in general aviation operations until 2016 but a steady 0.53 percent CAGR between 2017 and 2035. This

forecast essentially assumes that GA operation volumes at EUG will continue to stabilize, but will not return to pre-recession levels within the planning period. The TAF projects that the State of Oregon as a whole will see an overall increase in GA operations of 1.2 percent through 2035. This higher growth rate can be attributed to the rebound of GA activity expected at smaller airports around the state that serve only small GA aircraft, and which experienced a much higher level of decline during the 2008 recession.

If flight school operations increase, it is feasible that local GA operations may return to pre-recession levels. However, it is unlikely that total GA operations will return to historical highs within the planning period based on national trends and FAA forecasts of GA activity.

FIGURE 2-14
2015 FAA TAF GENERAL AVIATION AND MILITARY OPERATIONS



Source: FAA 2015 TAF Report

TABLE 2-7 presents the aircraft movements for general aviation and military aircraft forecasts from FAA's most recent TAF report. As shown, itinerant and local military operations are expected to remain flat through the planning period.

TABLE 2-7
ANNUAL GENERAL AVIATION AND MILITARY OPERATIONS FORECAST

Forecast Year	Itinerant Operations			Local Operations		
	General Aviation	Military	Total	General Aviation	Military	Total
2015	21,988	1,725	23,713	18,329	1,725	20,054
2020	21,991	1,725	23,716	18,322	1,725	20,047
2025	22,322	1,725	24,047	19,067	1,725	20,792
2035	23,000	1,725	24,725	20,649	1,725	22,374

Source: FAA 2015 TAF Report

2.4.4 Based Aircraft Forecasts

The FAA provides a forecast of based aircraft as part of the TAF, which is shown below in **TABLE 2-8**. This forecast shows a CAGR of 0.5 percent for single engine aircraft and 0.3 percent for jet aircraft. These growth rates are inconsistent with the national trends noted in the FAA Aerospace Forecast 2016-2036. That report's forecast for the national general aviation fleet indicates that fixed wing piston aircraft will see a 0.6 percent annual average rate of decline, and turbine jet aircraft fleet is expected to increase at a 2.5 percent annual average growth rate.

TABLE 2-8
2015 FAA TAF BASED AIRCRAFT FORECAST

Forecast Year	Single Engine	Jet	Multi-Engine	Helicopter	Other	Total
2015	152	15	15	4	0	186
2020	155	16	15	4	0	190
2025	159	16	15	4	0	194
2035	169	16	15	4	0	204

Source: FAA 2015 TAF Report

An understanding of based aircraft trends is difficult to determine as there is no formal wait list for hangars, and hangar rental is managed entirely by private parties. Because no one entity manages hangars at EUG, such as the airport administration or the fixed based operator, actual demand for T-hangar space is hard to quantify. The only gauge for demand is seen in applications to the airport for development of new hangars. In that regard, an increase in demand for new corporate hangars has been seen since the economy has rebounded from the 2008 recession. Evidence of this includes new corporate/executive type hangars being recently constructed in the East General Aviation Ramp area.

Overall, it appears EUG is experiencing GA growth and declines that are in-line with national trends. That is, an increase in jet fleets and stagnate growth of single engine piston aircraft. However, the FAA is forecasting growth of light-sport aircraft at an average rate of 4.5 percent annually. With a light sport aircraft community and a manufacturer existing at EUG, it is expected that this segment of aircraft type will grow at EUG through the planning period. Additionally, in conversations with Lane Aviation Academy it was noted that the school is working on expanding their operations, which is expected to result in additional based training aircraft.

With the lack of empirical data of historical based aircraft, a supplementary forecast to the TAF was developed. This forecast took the FAA's projection for jet growth of 2.5 percent and applied it to EUG existing based jet aircraft. The TAF forecast for all other categories was validated and carried forward. Though the FAA indicated that nationally, single engine piston will decrease at a rate of 0.6 percent annually, the TAF forecast for EUG indicated that 0.5 percent growth more representative of the expected GA growth in training and experiential aircraft fleets. **TABLE 2-9** summarizes the derivative based aircraft forecast.

TABLE 2-9
DERIVATIVE BASED AIRCRAFT FORECAST

Forecast Year	Single Engine	Jet	Multi-Engine	Helicopter	Other	Total
2015	152	17	15	4	0	188
2020	155	19	15	4	0	193
2025	159	22	15	4	0	200
2035	169	28	15	4	0	216
CAGR	0.5%	2.5%	0.0%	0.0%	0.0%	0.7%

Source: FAA 2015 TAF Report, RS&H Analysis, 2016

2.4.5 Air Cargo Forecasts

As discussed in **Section 2.3.3**, no cargo metrics showed any correlation with the economic indexes reviewed. Since 2009, according to the Bureau of Transportation Statistics, enplaned cargo has shown steady growth while deplaned cargo has been steadily declining, with the exception of 2015. Overall, enplaned cargo has seen an annual compounded growth rate of 0.01 percent since 2009. This trend was carried forward to project future enplaned cargo growth at EUG until 2020 after which it is projected to increase to 0.4 percent, which is the same CAGR seen at PDX since 2009. A minimum growth rate for deplaned cargo volume was applied at 0.01 percent annually for the entire planning period. **TABLE 2-10** summarizes the projected annual cargo volumes for the forecast period.

TABLE 2-10
AIR CARGO FORECAST VOLUME

Planning Year	Enplaned (lbs)	Deplaned (lbs)	Total (lbs)
2015	1,393,647	476,000	1,869,647
2020	1,394,344	476,502	1,870,846
2025	1,422,455	476,740	1,899,195
2035	1,480,388	477,217	1,957,606

Source: Eugene Airport Data, Bureau of Transportation Statistics RS&H Analysis, 2016

Future cargo operations were determined based on an average weight per operation found in 2015 historical data. This ratio was applied to the future volumes to generate a forecast of air cargo operations, which is detailed in **TABLE 2-11.**

TABLE 2-11
AIR CARGO FORECAST OPERATIONS

Planning Year	Total Operations
2020	1,105
2025	1,127
2035	1,173

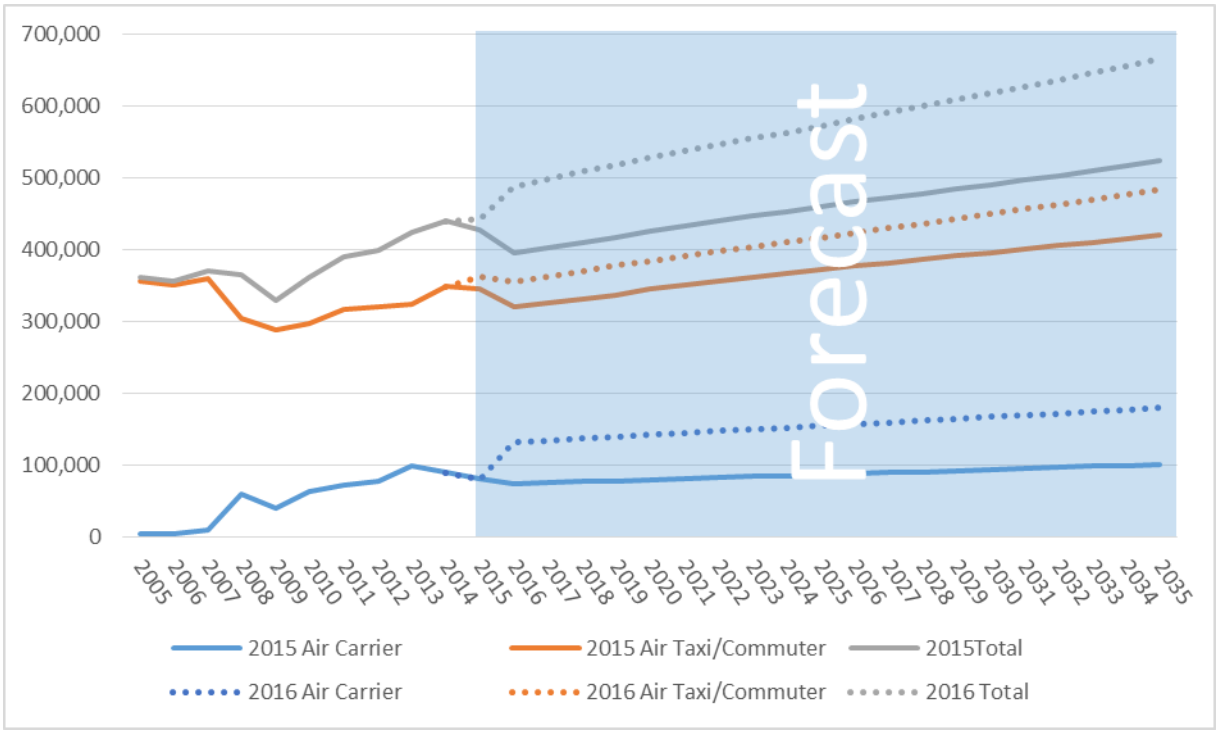
Source: RS&H Analysis., 2016

2.4.6 2016 Preliminary TAF Report Analysis

During the preparation of this forecast report, the FAA provided EUG airport management a draft of the preliminary 2016 TAF Report. The updated TAF, though not finalized, was adjusted by the FAA to reflect recent growth trends at EUG.

As shown in **FIGURE 2-15** and **TABLE 2-12**, the preliminary 2016 TAF forecasts a continual increase in total passenger enplanements, including a sharp increase in air carrier related enplanements. The preliminary forecast suggests a continued transition from smaller regional jet type aircraft to larger air carrier type aircraft, which is aligned with trends seen currently at EUG. The preliminary 2016 TAF enplanement forecast was carried forward as shown.

FIGURE 2-15
PRELIMINARY FAA 2016 TAF AND 2015 TAF ENPLANEMENT FORECAST COMPARISON



Source: FAA 2015 TAF Report, Preliminary 2016 TAF data

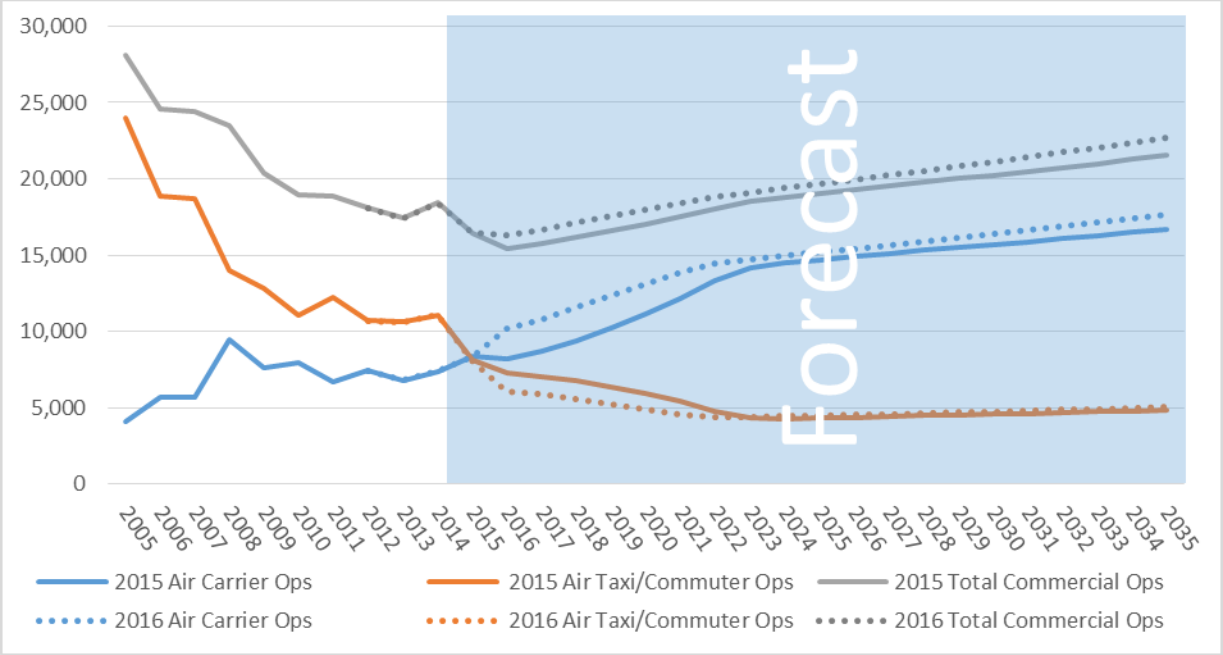
TABLE 2-12
PRELIMINARY FAA 2016 TAF AND 2015 TAF ENPLANEMENT FORECAST COMPARISON

Forecast Year	Annual Commercial Passenger Enplanements					
	2015 Air Carrier	2016 Air Carrier	2015 Air Taxi & Commuter	2016 Air Taxi & Commuter	2015 Total	2016 Total
2015	81,977	81,339	347,089	362,760	429,066	444,099
2020	80,733	143,322	345,529	385,154	426,262	528,476
2025	87,484	155,412	372,551	417,313	460,035	572,725
2035	102,035	181,100	421,938	485,189	523,973	666,289

Source: FAA 2015 TAF Report, Preliminary FAA 2016 TAF data

The preliminary 2016 TAF forecast for commercial operations correlates well with the 2016 TAF forecast of total commercial passenger enplanements and current conditions, as total operations are forecasted to be higher than the 2015 TAF suggested. As shown in **FIGURE 2-16** and **TABLE 2-13**, the preliminary TAF forecasts a greater increase in air carrier operations and an even further decrease of air taxi/commuter operations as compared to the 2015 TAF. This also correlates with the current and projected trends.

FIGURE 2-16
PRELIMINARY FAA 2016 TAF AND 2015 TAF OPERATIONS FORECAST COMPARISON



Source: FAA 2015 TAF Report, Preliminary 2016 TAF data

TABLE 2-13
PRELIMINARY FAA 2016 TAF AND 2015 TAF OPERATIONS FORECAST COMPARISON

Forecast Year	Annual Commercial Passenger Operations					
	2015 Air Carrier	2016 Air Carrier	2015 Air Taxi & Commuter	2016 Air Taxi & Commuter	2015 Total	2016 Total
2015	8,348	8,348	8,099	8,099	16,447	16,447
2020	11,111	13,140	5,950	4,870	17,061	18,010
2025	14,700	15,173	4,325	4,481	19,025	19,654
2035	16,698	17,640	4,839	5,024	21,537	22,664

Source: FAA 2015 TAF Report, Preliminary FAA 2016 TAF data

Overall, the preliminary FAA 2016 TAF data for total passenger enplanements and commercial operations was found to accurately depict current trends at EUG, and is more reflective of expected future conditions than the 2015 TAF. For this reason, the preliminary 2016 TAF data was carried forward in this master plan as the forecast for commercial passenger aviation activity.

In regard to the other forecasts within the preliminary 2016 TAF, no other forecast was substantially different from the 2015 TAF except for the local general aviation operations forecast. The preliminary 2016

TAF showed zero growth in this category, while the 2015 TAF showed small growth, as shown previously in **TABLE 2-7**. The bulk majority of local operations at EUG are comprised by Lane Aviation flight training aircraft. Through interviews with Lane Aviation, it was learned that they are working to expand their flight training program, and expect future growth. As such, it was determined that the growth scenario offered in the 2015 TAF better reflects anticipated future conditions. The difference between the 2015 TAF and the preliminary 2016 TAF for military operations and itinerant general aviation operations is negligible. With consideration of these factors, it was determined that bringing forward the formally approved FAA 2015 TAF for all general aviation and military operations was prudent and helps maintain forecast consistency.

2.5 DERIVATIVE COMMERCIAL PASSENGER FORECASTS

In order to examine the potential impact on key airport facilities of possible changes in air traffic volumes, alternative activity estimate scenarios of enplaned passenger and commercial aircraft operations were established. This effort began with an examination of four scenarios of commercial passenger related aviation activity based on trend analysis and statistical correlation of enplaned passenger volumes with various key economic indexes that generally impact air traffic growth as analyzed previously in **Section 2.4**.

The activity estimates generated by these scenarios were compared with the preliminary FAA 2016 TAF volumes to validate the draft TAF data and aid in examining a range of potential aviation activity that should be considered in the future.

2.5.1 Derivative Forecast Scenarios

As shown in **TABLE 2-14,** the analysis between historic annual passenger enplanement volumes at EUG between 2006 and 2015, and key economic indexes for the Eugene Metropolitan Area for the same period, shows a high statistical correlation between passenger enplanement and gross regional product, per capita income, and personal income when considering the coefficient of determination (R^2) found between them.

TABLE 2-14
LEVELS OF STATISTICAL CORRELATION

Economic Index	Coefficient of Determination (R^2)
Population	0.6021
Per Capita Income (in 2009 $)	0.8801
Personal Income	0.8814
Per Capita Income	0.8946
Gross Regional Product	0.9164

Source: Bureau of Economic Analysis, Woods and Poole, Airport Statistics and RS&H Computations

Accounting for this high correlation factor, three alternative forecast scenarios for enplaned passengers were established based on the expected growth of the region's gross regional product (Scenario 1), on the region's per capita income (Scenario 2), and on the region's personal income (Scenario 3). Additionally a fourth alternative scenario was prepared based on the historic trend in enplaned passenger annual volumes between 2006 and 2015. **TABLE 2-15** below presents the results of the analysis and compares the results with projected preliminary 2016 TAF values. The table also shows the compounded annual growth rates (CAGR) between the years of analysis. For 2020 the CAGR is computed against actual 2015 values.

TABLE 2-15
PASSENGER ENPLANEMENT SCENARIOS

Year	Prelim 2016 TAF	CAGR	Scenario 1 (GRP)			Scenario 2 (PCI)			Scenario 3 (PI)			Scenario 4 (Trend)		
			EPAX	CAGR	Variation with TAF	EPAX	CAGR	Variation with TAF	EPAX	CAGR	Variation with TAF	EPAX	CAGR	Variation with TAF
2020	528,476	3.54%	529,799	3.00%	0.3%	567,738	4.44%	7.4%	619,912	6.29%	17.3%	500,378	1.83%	-5.3%
2025	572,725	1.62%	589,614	2.16%	2.9%	680,172	3.68%	18.8%	787,385	4.90%	37.5%	558,471	2.22%	-2.5%
2035	666,289	1.52%	773,822	2.76%	16.1%	861,148	2.39%	29.2%	1,091,548	3.32%	63.8%	674,657	1.91%	1.3%

Source: Preliminary FAA 2016 TAF data, RS&H Computations, Bureau of Economic Analysis, Woods and Poole, 2016

TABLE 2-16 compares annual commercial operations values between the TAF and the four scenarios. Aircraft operation values where computed assuming similar current passenger to commercial operation ratios found for 2016.

TABLE 2-16
PASSENGER AIRCRAFT OPERATIONS SCENARIOS

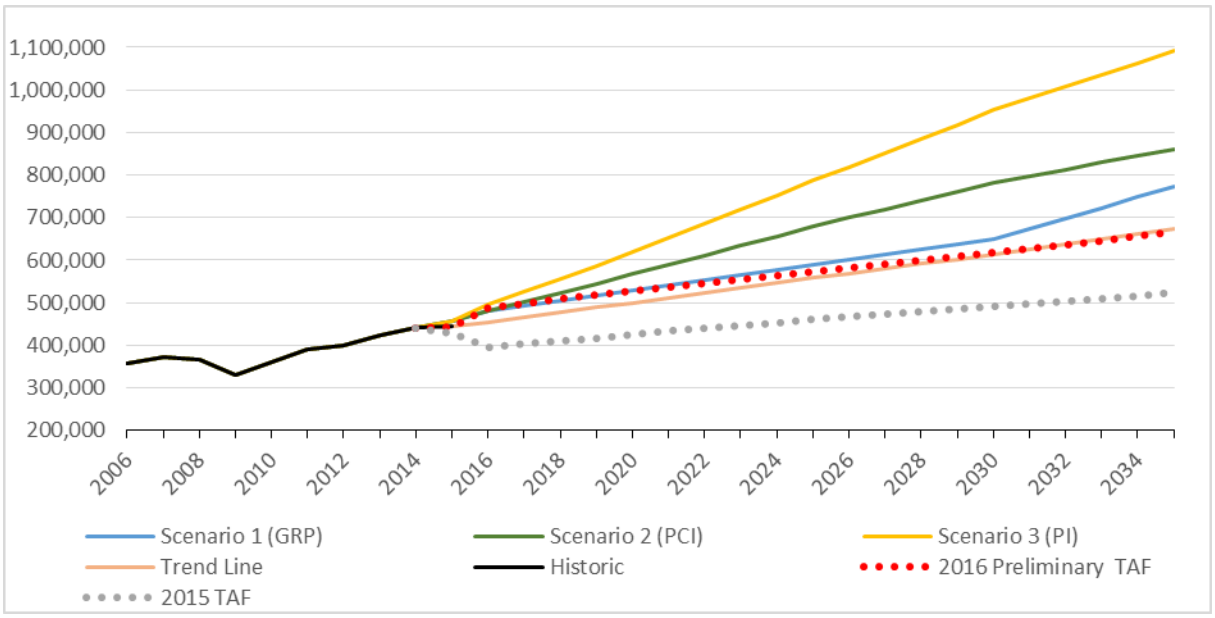
Year	Prelim 2016 TAF	CAGR	Scenario 1 (GRP)			Scenario 2 (PCI)			Scenario 3 (PI)			Scenario 4 (Trend)		
			OPS	CAGR	Variation with TAF	OPS	CAGR	Variation with TAF	OPS	CAGR	Variation with TAF	OPS	CAGR	Variation with TAF
2020	18,010	1.83%	16,454	2.09%	-8.6%	17,632	3.32%	-2.1%	19,252	4.46%	6.9%	15,540	2.13%	-13.7%
2025	19,654	1.76%	17,654	1.42%	-10.2%	20,366	2.92%	3.6%	23,576	4.14%	20.0%	16,722	1.48%	-14.9%
2035	22,664	1.44%	22,366	2.39%	-1.3%	24,890	2.03%	9.8%	31,548	2.96%	39.2%	19,500	1.55%	-14.0%

Source: Preliminary FAA 2016 TAF data, RS&H Computations, Bureau of Economic Analysis, Woods and Poole, 2016

From the results of the analysis, it is evident that the preliminary FAA 2016 TAF values for passenger enplanements closely follow Scenario 1 which is based on the Woods and Poole forecasted rate of growth for gross regional product in the Eugene area. Additionally, the historical trend line, Scenario 4, is also in line with Scenario 1 and the preliminary FAA 2016 TAF. Scenario 1 has the highest statistical correlation with historical data of any of the economic indicators that were analyzed. The fact that the preliminary FAA 2016 TAF values are very close to this highly correlated scenario as well as the extrapolated historical trend serves to validate the data as being a reasonable forecast for EUG. Thus, as previously noted, the preliminary 2016 TAF forecast for commercial enplanements and operations is being carried forward in this master plan.

FIGURE 2-17 illustrates the four scenario forecasts of enplanement levels along with the 2015 TAF and the preliminary 2016 TAF data. Scenario forecasts are useful for identifying a particular range of facility requirements that might be needed should air service grow at a faster or slower rate than identified by the preferred forecast (in this case the preliminary 2016 TAF). The analysis clearly indicates that the range of future passenger enplanement levels is likely to materialize somewhere between the trend line (Scenario 4) and Scenario 3 (the low and high scenarios). However, though Scenario 3 showed a reasonable amount of statistical correlation, the growth rate was determined to be too aggressive when compared to those better correlated indicators, and was removed from consideration. Thus the range of reasonable enplanement volumes that should be considered and planned for in the future lie between the historical trend and Scenario 2 (PCI). This range is used in the following section as a tool to validate the design day and design hour forecasts.

FIGURE 2-17
PASSENGER ENPLANEMENT SCENARIO COMPARISON



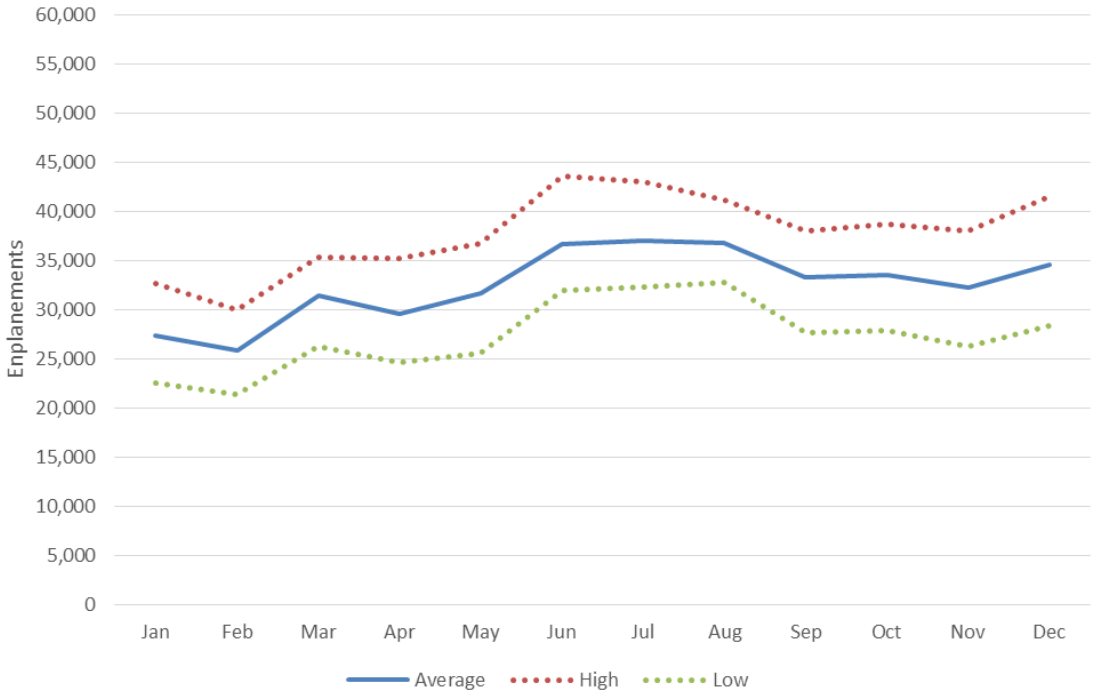
Source: FAA 2015 TAF, Preliminary FAA 2016 TAF data, RS&H Computations, Bureau of Economic Analysis, Woods and Poole, 2016

2.5.2 Design Day/Design Hour Analysis

In developing design day and design hour forecasts, consideration was made to determine a baseline flight schedule, representing the average peak day of the year that would fit within the range of passenger enplanement activity discussed in the previous section. This required the peak month be identified and a flight schedule for the peak day within that month be determined.

Historical passenger enplanement data, shown in **FIGURE 2-18** for Eugene Airport shows the summer months as being slightly busier than the rest of the year. Passenger traffic in the months of June, July, and August are generally very close in enplanement levels. Because July is historically the busiest month of the year at EUG, the 2016 July schedule was used as the baseline schedule for the forecast analysis.

FIGURE 2-18
MONTHLY TOTAL PASSENGER VOLUMES FROM 2005-2015



Source: FAA 2015 TAF Report, RS&H Analysis 2016

The 2016 July schedule included a recent shift in aircraft fleet related to United Airlines up-gauging regional jets to narrow-body aircraft. It was determined that Sunday was the peak day in the July 2016 schedule, and that day's flight schedule was carried forward as the baseline schedule for 2016.

To determine future flight schedules for the proposed planning years, informed predictions and assumptions were made to identify likely conditions that might occur over time, such as the addition of new routes and aircraft up-gauging. These assumptions are based on an analysis of passenger volumes to the top 15 destinations from the Eugene market, industry trends and talks with airport staff about current and potential future market growth opportunities. Of EUG's top 20 true markets, shown in **TABLE 2-17**, nine are currently served with non-stop flights. Based on the number of passengers from the Eugene catchment area that fly either from EUG through other connecting airports or drive to PDX, it is expected that new non-stop flights to San Diego and Phoenix (PHX) will begin service in the future to fill un-served demand. Additionally, a strong market demand in the region for direct service to Chicago (ORD) and Minneapolis (MSP) and cities served from those airports has been identified. To fill that demand, it is assumed a direct flight to both airports will also start service in the future.

TABLE 2-17
EUG TOP 20 TRUE MARKETS

Rank	Airport	Airport Identifier	Currently Served
1	Los Angeles, CA	LAX	✓
2	Las Vegas, NV	LAS	✓
3	San Francisco, CA	SFO	✓
4	Seattle, WA	SEA	✓
5	Oakland, CA	OAK	✓
6	San Diego, CA	SAN	No
7	Phoenix, AZ	PHX	No
8	Denver, CO	DEN	✓
9	Phoenix, AZ	AZA	✓
10	San Jose, CA	SJC	✓
11	Orange County, CA	SNA	No
12	Salt Lake City, UT	SLC	✓
13	Chicago, IL	ORD	No
14	Dallas, TX	DFW	No
15	Orlando, FL	MCO	No
16	Honolulu, HI	HNL	No
17	Sacramento, CA	SMF	No
18	Boston, MA	BOS	No
19	Minneapolis, MN	MSP	No
20	Spokane, WA	GEG	No

Source: Eugene Airport Passenger Demand Analysis Report, 2016

The assumptions for new routes were blended with industry trends to generate a hypothetical gate schedule for each planning year of this study. These schedules were then analyzed to determine future passenger enplanement and operational levels as well as peak periods of activity for each planning year. The specific assumptions for each planning period are described below:

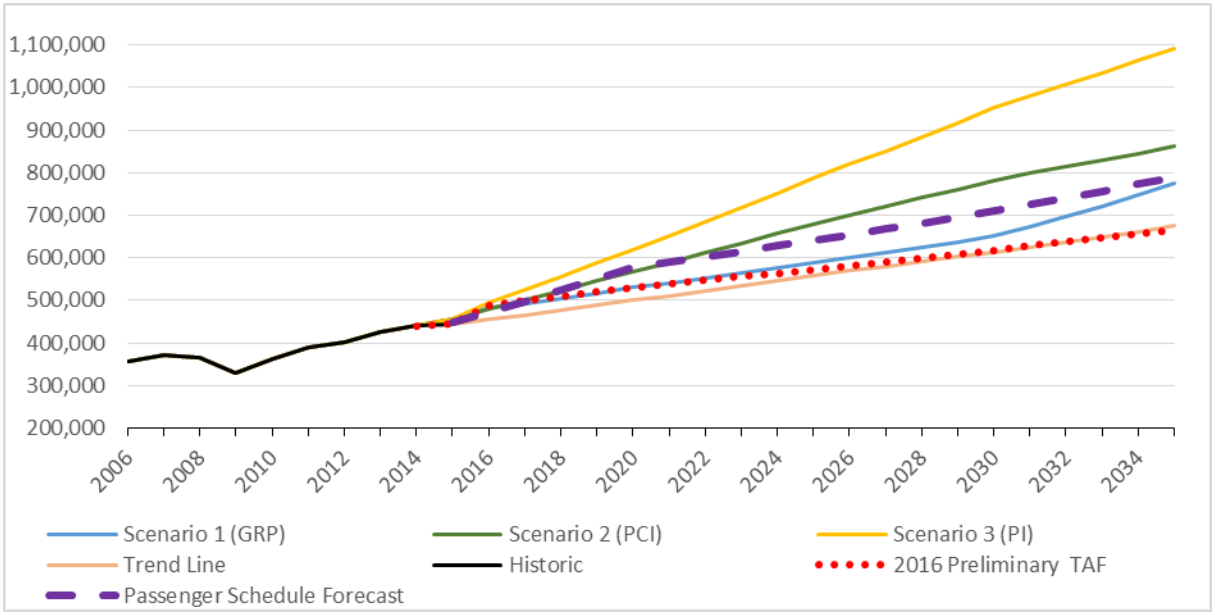
- **Planning Year 2020 –** American Airlines adds a new daily flight to Phoenix Sky Harbor International Airport using EMB 175 aircraft. Alaska adds one new daily flight to San Diego using EMB 175 aircraft. United has fully up-gauged all routes that were using CRJ aircraft, and now uses only EMB 175, A319, A320, and B737 aircraft. Allegiant is fully transitioned from MD-83 aircraft to A320 aircraft
- **Planning Year 2025 –** United adds a daily flight to Chicago (ORD) using EMB 175 aircraft and also adds a flight to SFO with an EMB 175. American up-gauges its flight to PHX using an A-320/737-8.
- **Planning Year 2035 –** American Airlines adds a daily flight to Los Angeles using 737-MAX aircraft. American Airlines also adds another daily flight to Phoenix using EMB-175 aircraft and Delta Airlines adds a daily flight to Minneapolis/St Paul Airport (MSP) using EMB-175. United up-

gauges its flight to ORD using an A-320 and increases frequency of flights to SFO to total of 5 daily flights seven days a week. Allegiant increases its frequency to Las Vegas from 2 to 4 weekly flights**.**

The annual passenger enplanement levels generated by these hypothetical flight schedules is represented by the purple dashed line in **FIGURE 2-19** below. It is important to recognize that the flight schedules were made to represent the peak month. This is the primary reason why the schedule based enplaned passenger levels are higher than Scenario 1 and the preliminary 2016 TAF, and why these levels are not used as the forecast for annual enplanements. The exercise of comparing the schedule based levels to the scenarios and the TAF is to ensure the schedule based analysis is valid, and is within reasonable forecast parameters.

As shown, the enplanement levels estimated by these flight schedules is within the middle portion of the range represented by the various enplanement scenarios. This fact serves to validate that the schedules and planning factors used to estimate these passenger levels are within reason, and that they will provide a solid basis for facility planning.

FIGURE 2-19
ESTIMATED ANNUAL PASSENGER VOLUMES BASED ON PLANNING DAY FLIGHT SCHEDULES COMPARED WITH ALTERNATIVE SCENARIOS



Source: FAA 2015 TAF, Preliminary FAA 2016 TAF data, RS&H Computations, Bureau of Economic Analysis, Woods and Poole, 2016

Annual passenger volumes, design day levels, and design hour levels that were identified from the planning day flight schedules for each planning year are detailed in **TABLE 2-18**. **Appendix B** provides the hypothetical gate schedule for each planning year as well the associated analysis for each planning year's peak hour enplanement and deplanement data and gate occupancy levels.

The analysis of existing passenger volumes identified slightly more annual enplaned passenger volumes than deplaned passenger volumes. This anomaly is attributed to similar regional service factors that resulted in higher enplaned cargo than deplaned cargo. As noted above, there is a limited number of inbound non-stop markets available directly into Eugene Airport compared to the larger number of communities having direct service into Portland International Airport. Therefore many passengers arriving

into the region have greater accessibility directly into Portland International Airport than is available at Eugene Airport. Consequently, passengers entering the region may often choose to fly into Portland than into smaller airports such as Eugene.

The difference is also estimated to be tied to passenger traffic generated by the two universities (University of Oregon and Oregon State University) that are nearby EUG. It is assumed that many students from outside the region arrive to their school via their own vehicle with their parents or other family members. Once students are settled on campus, their family members depart the region using air service from EUG, thereby generating more enplaning passengers annually.

TABLE 2-18
ESTIMATED ANNUAL PASSENGER VOLUMES BASED ON PLANNING DAY FLIGHT SCHEDULES

Description	2015	Planning Years		
		2020	2025	2035
Enplaned Passengers				
Annual Volume	444,099	585,036	640,284	775,809
Design Day	1,945	2,156	2,308	2,634
Design Hour	338	359	350	416
Deplaned Passengers				
Annual Volume	446,017	580,356	635,162	769,603
Design Day	1,945	2,156	2,308	2,634
Design Hour	357	376	383	383
Combined (Enplaned and Deplaned)				
Annual Volume	890,116	1,165,392	1,275,446	1,545,412
Design Day	3,890	4,312	4,616	5,268
Design Hour	570	604	599	672

Source: Airport Records, Preliminary 2016 TAF data, RS&H Analysis, 2016
Notes: Design Day, Design Hour based on analysis of July 2016 schedule.
Annual passenger volumes based on planning day flight schedule analysis

2.5.3 Peak Hour Operations and Gate Occupancy

Currently, EUG experiences a commercial passenger aircraft peak hour of six combined arrival and departure operations, four arrival operations, and four departure operations. The combined peak is between 6PM to 7PM, whereas the peak departures are in the morning, and peak arrivals in the late evening. As shown in **TABLE 2-19**, the arrival and departure peak is expected to increase to eight aircraft per hour. Based on the planning flight schedule, the arrival peak will increase to five, while the departure peak will increase to eight aircraft per hour within the planning period. The departure peak is largely associated with the morning flights that are conducted by remain-over-night (RON) aircraft.

Peak hour gate/stand occupancy at EUG in 2015 was calculated to be approximately ten aircraft, as illustrated in **TABLE 2-19**. This peak is driven by RON aircraft that arrive each night and sit at a gate or at a remote parking stand until they depart during the morning peak. The analysis indicates that the peak hour gate/stand occupancy will increase to 15 aircraft by the end of the planning period. This is greater

than peak hour operations because this number represents the number of aircraft that are sitting on the ground at the same time, not the number of aircraft operating.

TABLE 2-19
COMMERCIAL SERVICE AIRCRAFT PEAK HOUR OPERATIONS AND GATE OCCUPANCY

Description	2015	Planning Years		
		2020	2025	2035
Peak Hour Operations				
Arrivals	4	4	4	5
Departures	4	5	6	8
Arrival & Departures	6	6	6	8
Peak Hour Gate/Stand Occupancy	10	11	12	15

Source: RS&H Analysis, 2016

2.5.4 Airline Breakdown Passengers and Operations

The airlines serving the EUG market currently include Alaska Airlines, United, Delta, American Airlines, and Allegiant Air. **FIGURE 2-20** illustrates the passenger market share for each airline in each forecast year of the planning period. Alaska Airlines and United currently serve nearly 70% of the total market, while other airlines jointly serve the remaining 30%. This current market share is expected to carry forward through the planning period, albeit some variation is due to new routes being offered by specific airlines.

FIGURE 2-20
SHARE OF ENPLANED PASSENGERS BY AIR CARRIER

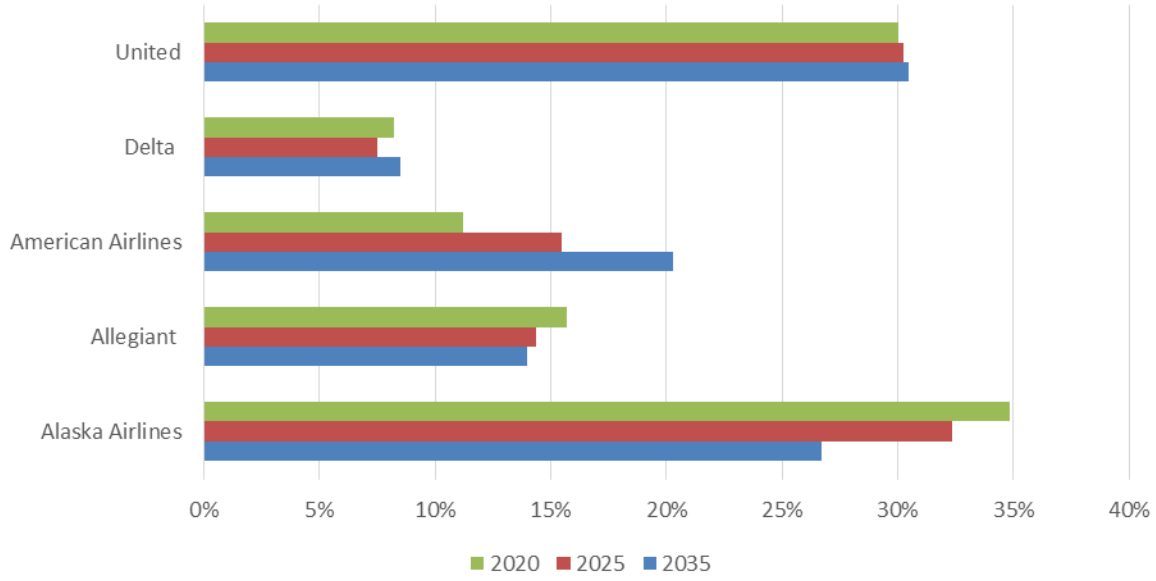


TABLE 2-20 presents the breakdown of forecast enplaned passengers and aircraft operations by airline for the 20-year planning horizon.

TABLE 2-20
FORECAST OF ENPLANED PASSENGERS AND AIRCRAFT OPERATIONS BY AIRLINE

Description	Planning Years		
	2020	2025	2035
Enplaned Passengers	**528,476**	**572,725**	**666,289**
Alaska Airlines	184,030	185,446	178,055
Allegiant	82,975	82,164	93,275
American Airlines	59,225	88,763	135,212
Delta	43,481	43,056	56,783
United	158,764	173,295	202,964
Commercial Operations	**13,000**	**15,000**	**18,000**
Alaska Airlines	6,020	6,635	6,677
Allegiant	960	1,058	1,258
American Airlines	1,832	2,019	3,387
Delta	1,221	1,346	2,032
United	2,966	3,942	4,645

Source: Preliminary FAA 2016 TAF Data, RS&H Analysis, 2016

2.6 CRITICAL AIRCRAFT

The FAA recommends the identification of the existing and future design aircraft for airport planning purposes. In many cases the design aircraft is made from a family or collection of aircraft that are planned to be accommodated by the airport. For airports with multiple runways, design aircraft are identified for each runway. In regards to EUG, both runways share the same design aircraft.

Three parameters are used to classify the design aircraft: Aircraft Approach Category (AAC) shown in **FIGURE 2-21**, Airplane Design Group (ADG) shown in **FIGURE 2-22**, and Taxiway Design Group (TDG) shown in **FIGURE 2-23**. The ACC, depicted by a letter, relates to aircraft landing speeds. The ADG, depicted by a Roman numeral, relates to airplane wingspan and height. The TDG, classified by number, relates to the outer to outer main gear width and the distance between the cockpit and main gear. These parameters serve as the basis of the design and construction of airport infrastructure.

FIGURE 2-21
AIRCRAFT APPROACH CATEGORY

AAC	V_{REF}/Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

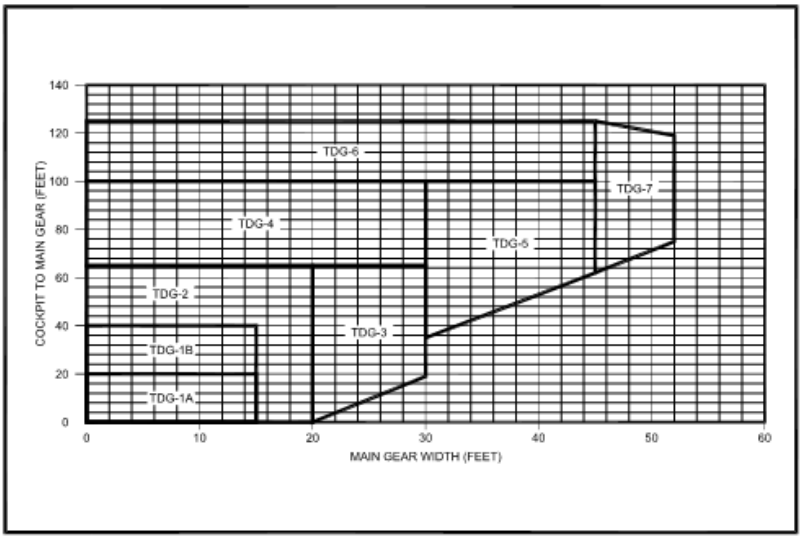
Source: FAA AC 150/5300-13A Change 1 *Airport Design*

FIGURE 2-22
AIRCRAFT DESIGN GROUP

Group #	Tail Height (ft [m])	Wingspan (ft [m])
I	< 20′ (< 6 m)	< 49′ (< 15 m)
II	20′ - < 30′ (6 m - < 9 m)	49′ - < 79′ (15 m - < 24 m)
III	30′ - < 45′ (9 m - < 13.5 m)	79′ - < 118′ (24 m - < 36 m)
IV	45′ - < 60′ (13.5 m - < 18.5 m)	118′ - < 171′ (36 m - < 52 m)
V	60′ - < 66′ (18.5 m - < 20 m)	171′ - < 214′ (52 m - < 65 m)
VI	66′ - < 80′ (20 m - < 24.5 m)	214′ - < 262′ (65 m - < 80 m)

Source: FAA AC 150/5300-13A Change 1 *Airport Design*

FIGURE 2-23
TAXIWAY DESIGN GROUP



Source: FAA AC 150/5300-13A Change 1 *Airport Design*

The 2010 Airport Layout Plan defined the current critical aircraft as a Boeing B737-300, which is a C-III-3 aircraft. At the present time, the largest and most demanding commercial service aircraft operated at the Airport is the Boeing MD-83 (D-III-4) operated by Allegiant Airlines, Bombardier Q400 (C-III-5) operated by Horizon Airlines (a subsidiary of Alaska Airlines), and the Boeing 737-900 (D-III-3) operated by United. In regard to AAC and ADG the MD-83 and B737-900 are the most demanding as D-III aircraft. For taxiway design, the Q400 is the most demanding as a TDG 5 aircraft.

In the future, the MD-83 is planned to be phased out of Allegiant Airlines fleet by 2020[3], and replaced by A320 aircraft. The Bombardier Q400 is also being phased out by Horizon and replaced with Embraer E175 jets. However, Alaska's fleet transition is not expected to occur at EUG within the next 10 years, and perhaps not within the planning period. The transition to E175 equipment is strategically designed to allow Alaska to better serve "long, thin routes"[4] which are described as routes that are better served by jet aircraft but lack the demand necessary to profitably fill the airline's B737 narrow-body aircraft. Because the vast majority of service from EUG by Alaska airlines are short haul routes, the Q400 is expected to remain the equipment of choice.

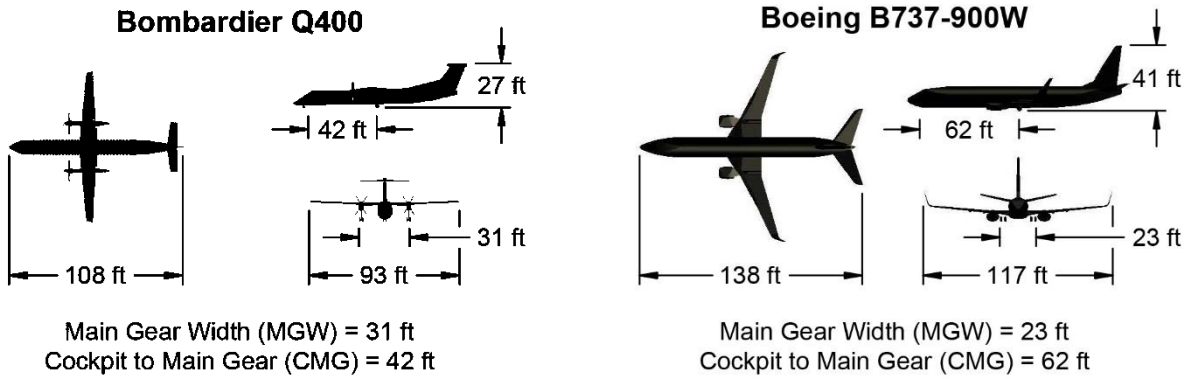
With the discontinuation of MD-83 use by commercial airlines in the future, the existing and future critical aircraft for EUG is identified as the Boeing 737-900 and Bombardier Q400. The dimensions of these

[3] "Allegiant Air's MD-80 Plans Depend on Finding A320s," Aviation Daily, April 14, 2016
[4] "Alaska Air's Horizon places big order for Embraer E175 jets," USA Today, April 12, 2016

aircraft are shown below in **FIGURE 2-24**. These aircraft create a composite critical aircraft that require airfield design standards to accommodate the following:

- Aircraft Approach Category D
- Aircraft Design Group III
- Taxiway Design Group 5

FIGURE 2-24
CRITICAL AIRCRAFT



Main Gear Width (MGW) = 31 ft
Cockpit to Main Gear (CMG) = 42 ft

Main Gear Width (MGW) = 23 ft
Cockpit to Main Gear (CMG) = 62 ft

2.7 FLEET MIX FOR NOISE MODEL ANALYSIS

This section details the fleet mix data that will be used for the noise model analysis that is part of this master plan project. The fleet mix was derived based on existing and presumed commercial passenger and cargo aircraft operations, charter operations, local and itinerant general aviation operations, and common military operations. **TABLE 2-21** summarizes the current daily fleet mix of commercial passenger jet and turbo prop aircraft operating at EUG, and their operating time according to the July 2016 flight schedule. The schedule is used as a baseline for commercial passenger aircraft operations.

TABLE 2-21
CURRENT FLIGHT SCHEDULE BY MAJOR AIR CARRIER

Carrier	Aircraft	Arrival Time	City	Departure Time	Destination City
Alaska	Q400	9:03am	Seattle	9:35am	Portland
Alaska	Q400	12:30pm	Portland	1:02pm	Seattle
Alaska	Q400	1:23pm	Seattle	1:58pm	Portland
Alaska	Q400	3:36pm	Portland	4:10pm	San Jose
Alaska	Q400	6:01pm	Portland	6:33pm	Portland
Alaska	Q400	6:28pm	Seattle	6:59pm	Seattle
Alaska	Q400	9:10pm	San Jose	5:10am	Portland
Alaska	Q400	10:08pm	Portland	6:10am	Seattle
Alaska	Q400	11:59pm	Seattle	8:00am	Seattle
Allegiant	MD-83	10:11am	Las Vegas	10:51am	Los Angeles
Allegiant	MD-83	12:44pm	Phoenix/Mesa	1:29pm	Oakland
Allegiant	MD-83	3:39pm	Los Angeles	4:19pm	Las Vegas
Allegiant	MD-83	4:58pm	Oakland	5:43pm	Phoenix/Mesa
American	EMB-175	2:39pm	Los Angeles	3:10pm	Los Angeles
American	EMB-175	9:52pm	Los Angeles	6:30am	Los Angeles
Delta	CRJ-700	11:57am	Salt Lake City	12:34pm	Salt Lake City
Delta	CRJ-700	10:50pm	Salt Lake City	6:15am	Salt Lake City
United	EMB-175	9:43 AM	San Francisco	10:18 AM	San Francisco
United	B737-900	12:58 PM	San Francisco	2:01 PM	San Francisco
United	CRJ-200	2:38 PM	Denver	3:10 PM	Denver
United	A320	5:38 PM	San Francisco	6:35 PM	San Francisco
United	A319	9:03 PM	Denver	5:28 AM	Denver
United	B737-900	10:51 PM	San Francisco	6:00 AM	San Francisco

Source: Eugene Airport July 2016 Flight Schedule

TABLE 2-22 summarizes the current and the expected fleet mix for the 10-year planning horizon to be used for the noise model analysis. The 2016 fleet mix was established from the airports July 2016 flight schedule, while 2025 values where derived assuming flight schedules will have little variations from their current hours except for forecasted changes in aircraft types as airlines continue to modernize and up-gauge their fleet, and new routes. The single, twin, and jet categories are derived from a breakdown of all general aviation and military operations.

TABLE 2-22
AIRPORT FLEET MIX (2016 AND 2025)

		2016			2025		
Aircraft	**Stage**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Q400	3	14	4	18	14	4	18
MD-86	3	4	-	4	-	-	0
EMB-175/190	3	3	1	4	9	3	12
CRJ-200/700/900	3	6	2	8	2	2	4
737-700/900	3	4	-	4	6	-	6
A320	3/4	4	2	6	10	2	12
A319	3/4	2	-	2	1	1	2
Single Engine	-	67	5	72	66	5	71
Twin Engine	-	21	3	24	21	3	24
Jet	-	25	2	27	25	2	27
Total		**150**	**19**	**169**	**154**	**22**	**176**

Source: RS&H Analysis, 2016

2.8 SUMMARY OF AVIATION DEMAND FORECASTS

The following tables summarize the forecast activity levels for passengers, aircraft movements, air cargo and based aircraft for the five-, 10-, and 20-year planning horizons. Both the 2015 and preliminary 2016 FAA TAF were carried forward in this forecast. The preliminary 2016 TAF data was used only for the forecasts associated with commercial passenger service; that being enplaned passengers, commuter/air taxi operations, and air carrier operations. The 2015 TAF was used for all other forecasts as the forecast for general aviation operations better represents the study findings of aviation demand, as described in **Section 2.4.6**.

Table 2-29 details the percentage difference between the master plan forecast and both the 2015 and preliminary 2016 TAF. As detailed in that table, differences exist between the master plan forecast and the TAF forecasts. The master plan forecast differs less than 5.2 percent when compared to the preliminary 2016 TAF forecast of enplanements, commercial operations, and total operations. Per AC 150/5070-6B Change 2, *Airport Master Plans*, a forecast that differs by 10 percent or less with the FAA TAF is considered consistent with the TAF and is acceptable. This master plan forecast is within the 10 percent difference threshold.

TABLE 2-23
COMMERCIAL PASSENGER FORECASTS

Description	2015	Planning Years		
		2020	2025	2035
Enplaned Passengers				
Annual Volume	444,099	528,476	572,725	666,289
CAGR		3.5%	1.6%	1.5%
Design Day	1,945	2,156	2,308	2,634
Design Hour	338	359	350	416
Deplaned Passengers				
Annual Volume	446,017	524,248	568,143	660,959
CAGR		3.3%	1.6%	1.5%
Design Day	1,945	2,156	2,308	2,634
Design Hour	357	376	383	383
Combined (Enplaned and Deplaned)				
Annual Volume	890,116	1,052,724	1,140,868	1,327,248
CAGR		3.4%	1.6%	1.5%
Design Day	3,890	4,312	4,616	5,268
Design Hour	570	604	599	672

Source FAA Preliminary 2016 TAF data, Airport Records, RS&H Analysis, 2016
Notes: Design Day, Design Hour based on analysis of July 2016 schedule.
Annual enplaned passenger volumes based on Preliminary FAA 2016 TAF data

TABLE 2-24
AIR CARGO FORECASTS

Description	2015	Planning Years		
		2020	2025	2035
Annual Cargo Volume (lbs)	1,869,647	1,870,846	1,899,195	1,957,606
CAGR		0.01%	0.30%	0.30%
Annual All Cargo Operations	1,105	1,105	1,127	1,173
CAGR		0.00%	0.40%	0.40%

Source: Bureau of Transportation Statistics, Airport Records, RS&H Analysis, 2016

TABLE 2-25
TOTAL AND COMMERCIAL AIRLINE OPERATIONS FORECAST

Description	2015	Planning Years		
		2020	2025	2035
Total Airport Operations				
Annual Operations	60,214	61,773	64,493	69,763
CAGR		0.5%	0.9%	0.8%
Peak Month	6,131	6,177	6,449	6,976
Average Day	204	206	215	233
Commercial Passenger Operations				
Annual Commercial Operations	16,447	18,010	19,654	22,664
CAGR		1.8%	1.8%	1.4%
Annual Air Carrier Operations	8,348	13,140	15,173	17,640
CAGR		9.5%	2.9%	1.5%
Annual Commuter Operations	8,099	4,870	4,481	5,024
CAGR		-9.7%	-1.7%	1.2%
Peak Month Operations	1,240	1,801	1,965	2,266
Average Day Operations	41	60	66	76
Peak Hour Operations				
Arrivals	4	4	4	5
Departures	4	5	6	8
Arrival & Departures	6	6	6	8

Source: Airport Records, FAA 2015 TAF Report, FAA Preliminary 2016 TAF data, RS&H Analysis, 2016

TABLE 2-26
GENERAL AVIATION AND MILITARY OPERATIONS FORECAST

Description	2015	Planning Years		
		2020	2025	2035
Itinerant General Aviation	21,988	21,991	22,322	23,000
CAGR		0.0%	0.2%	0.2%
Itinerant Military	1,725	1,725	1,725	1,725
Local Civil Operations	18,329	18,322	19,067	20,649
CAGR		0.0%	0.4%	0.6%
Local Military	1,725	1,725	1,725	1,725

Source: FAA 2015 TAF Report

TABLE 2-27
BASED AIRCRAFT FORECAST

Description	2015	Planning Years		
		2020	2025	2035
Based Aircraft	188	193	200	216
CAGR		0.5%	0.6%	0.7%

Source: FAA 2015 TAF Report, RS&H Analysis, 2016

TABLE 2-28
OVERALL SUMMARIZATION OF AIRPORT PLANNING FORECASTS

						Average Annual Compound Growth Rates			
	Base Yr. Level	Base Yr.+1yr.	Base Yr.+5yrs.	Base Yr.+10yrs.	Base Yr.+20yrs.	Base Yr. to +1	Base Yr. to +5	Base Yr. to +10	Base Yr. to +20
	2015	2016	2020	2025	2035	2015	2020	2025	2035
Passenger Enplanements									
Air Carrier	81,339	132,402	143,322	155,412	181,100	62.78%	12.00%	6.69%	4.08%
Commuter	362,760	356,322	385,154	417,313	485,189	-1.77%	1.21%	1.41%	1.46%
TOTAL	444,099	488,724	528,476	572,725	666,289	10.05%	3.54%	2.58%	2.05%
Operations									
Itinerant									
Air carrier	8,348	10,191	13,140	15,173	17,640	22.08%	9.50%	6.16%	3.81%
Commuter/air taxi	8,099	6,085	4,870	4,481	5,024	-24.87%	-9.67%	-5.75%	-2.36%
Total Commercial Operations	16,447	16,276	18,010	19,654	22,664	-1.04%	1.83%	1.80%	1.62%
General aviation	21,988	21,731	21,991	22,322	23,000	-1.17%	0.00%	0.15%	0.23%
Military	1,725	1,725	1,725	1,725	1,725	0.00%	0.00%	0.00%	0.00%
Local									
General aviation	18,329	17,747	18,322	19,067	20,649	-3.18%	-0.01%	0.40%	0.60%
Military	1,725	1,725	1,725	1,725	1,725	0.00%	0.00%	0.00%	0.00%
TOTAL OPERATIONS	60,214	59,204	61,773	64,493	69,763	-1.68%	0.51%	0.69%	0.74%
Peak Hour Operations	6	6	6	6	8	0.00%	0.00%	0.00%	1.45%
Cargo/mail (enplaned + deplaned tons)	1,869,647	1,870,098	1,870,846	1,899,195	1,957,606	0.02%	0.01%	0.16%	0.23%
Based Aircraft									
Single Engine (Nonjet)	152	153	155	159	169	0.66%	0.39%	0.45%	0.53%
Multi Engine (Nonjet)	15	15	15	15	15	0.00%	0.00%	0.00%	0.00%
Jet Engine	17	17	19	22	28	0.00%	2.25%	2.61%	2.53%
Helicopter	4	4	4	4	4	0.00%	0.00%	0.00%	0.00%
Other	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
TOTAL	188	189	193	200	216	0.53%	0.53%	0.62%	0.70%

Source: FAA 2015 TAF Report, FAA Preliminary 2016 TAF data, RS&H Analysis, 2016

TABLE 2-29
COMPARISON OF AIRPORT PLANNING FORECAST, 2015 TAF, AND PRELIMINARY 2016 TAF

	Year	Master Plan Forecast	2015 TAF	MPU Forecast/ 2015 TAF % Difference	2016 TAF	MPU Forecast/ 2016 TAF % Difference
Passenger Enplanements						
Base yr.	2015	444,099	429,066	3.39%	444,099	0.00%
Base yr. + 5yrs.	2020	528,476	426,262	19.34%	528,476	0.00%
Base yr. + 10yrs.	2025	572,725	460,035	19.68%	572,725	0.00%
Base yr. + 20yrs.	2035	666,289	523,973	21.36%	666,289	0.00%
Commercial Operations						
Base yr.	2015	16,447	16,447	0.00%	16,447	0.00%
Base yr. + 5yrs.	2020	18,010	17,061	5.27%	18,010	0.00%
Base yr. + 10yrs.	2025	19,654	19,025	3.20%	19,654	0.00%
Base yr. + 20yrs.	2035	22,664	21,537	4.97%	22,664	0.00%
Total Operations						
Base yr.	2015	60,214	60,214	0.00%	60,214	0.00%
Base yr. + 5yrs.	2020	61,773	60,824	1.54%	60,558	1.97%
Base yr. + 10yrs.	2025	64,493	63,864	0.98%	62,535	3.04%
Base yr. + 20yrs.	2035	69,763	68,636	1.62%	66,226	5.07%

Source: FAA 2015 TAF Report, FAA Preliminary 2016 TAF data, RS&H Analysis, 2016

APPENDIX B

GATE SCHEDULES, GATE OCCUPANCIES, AND PEAK HOUR GRAPHS

TABLE B-1
BASELINE COMMERCIAL AIRLINE SCHEDULE – JULY 2016

Destination	Carrier	Arrives	Departs	Aircraft	Seats
PDX	Alaska Airlines	9:03 AM	9:35 AM	Q-400	78
PDX	Alaska Airlines	1:23 PM	1:58 PM	Q-400	78
PDX	Alaska Airlines	6:10 PM	6:33 PM	Q-400	78
PDX	Alaska Airlines	9:10 PM	5:10 AM	Q-400	78
SEA	Alaska Airlines	12:30 PM	1:02 PM	Q-400	78
SEA	Alaska Airlines	6:28 PM	6:59 PM	Q-400	78
SEA	Alaska Airlines	10:08 PM	6:10 AM	Q-400	78
SEA	Alaska Airlines	11:59 PM	8:00 AM	Q-400	78
SJC	Alaska Airlines	3:36 PM	4:10 PM	Q-400	78
LAS	Allegiant	10:11 AM	10:51 AM	MD-83	166
LAX	Allegiant	3:39 PM	6:19 PM	MD-83	166
IWA	Allegiant	12:44 PM	1:29 PM	MD-83	166
OAK	Allegiant	4:58 PM	5:43 PM	MD-83	166
LAX	American Airlines	2:39 PM	3:10 PM	EMB175	76
LAX	American Airlines	9:52 PM	6:30 AM	EMB175	76
SLC	Delta	11:57 AM	12:34 PM	CRJ/ CRJ7	76
SLC	Delta	10:50 PM	6:15 AM	CRJ/ CRJ7	76
DEN	United	2:38 PM	3:10 PM	A319/ EMB175/ CRJ	50
DEN	United	9:03 PM	5:28 AM	A319 /EMB175/ CRJ	84
SFO	United	12:58 PM	2:01 PM	A320/ 738/ 739	165
SFO	United	9:43 AM	10:18 AM	CRJ/ EMB175	76
SFO	United	5:38 PM	6:35 PM	A320/ 739	164
SFO	United	10:51 PM	6:00 AM	A319/ A320	139

FIGURE B-1
BASELINE (JULY 2016) GATE OCCUPANCY

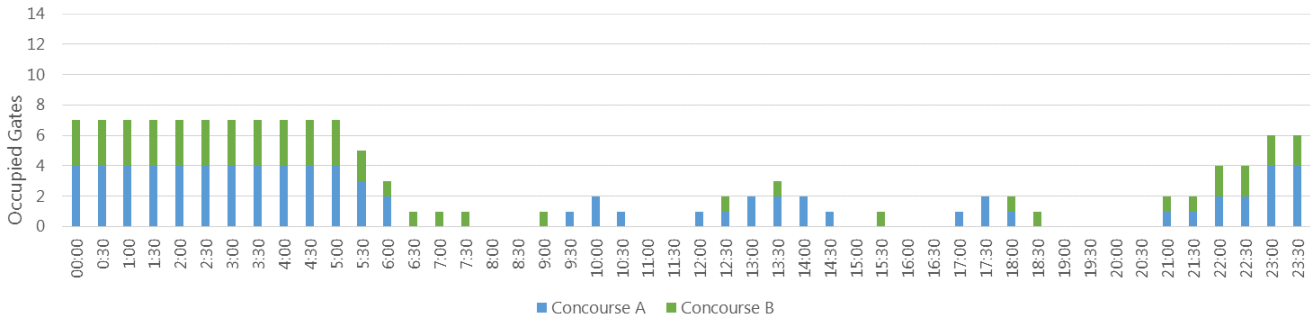


FIGURE B-2
BASELINE (JULY 2016) PEAK HOUR PASSENGER ENPLANEMENTS

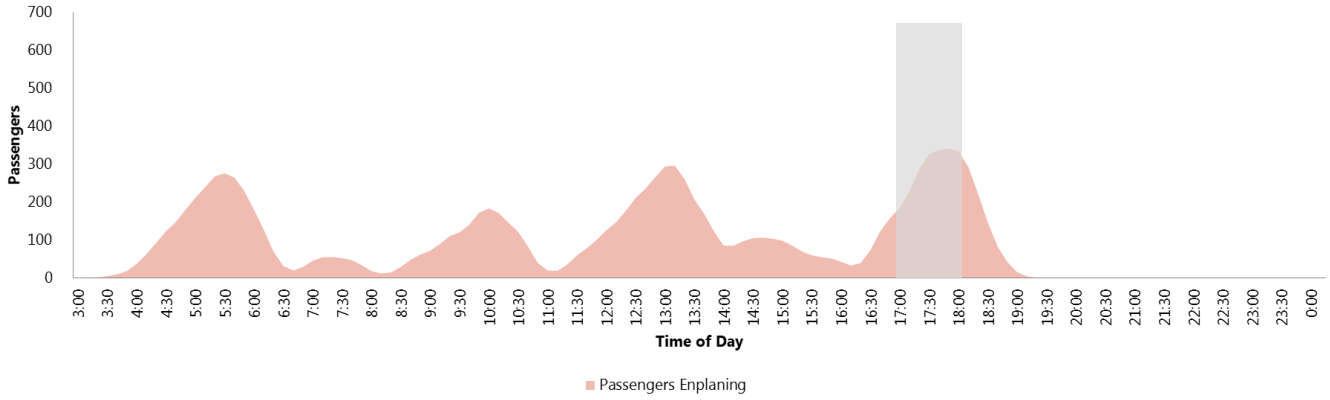


FIGURE B-3
BASELINE (JULY 2016) PEAK HOUR PASSENGER DEPLANEMENTS

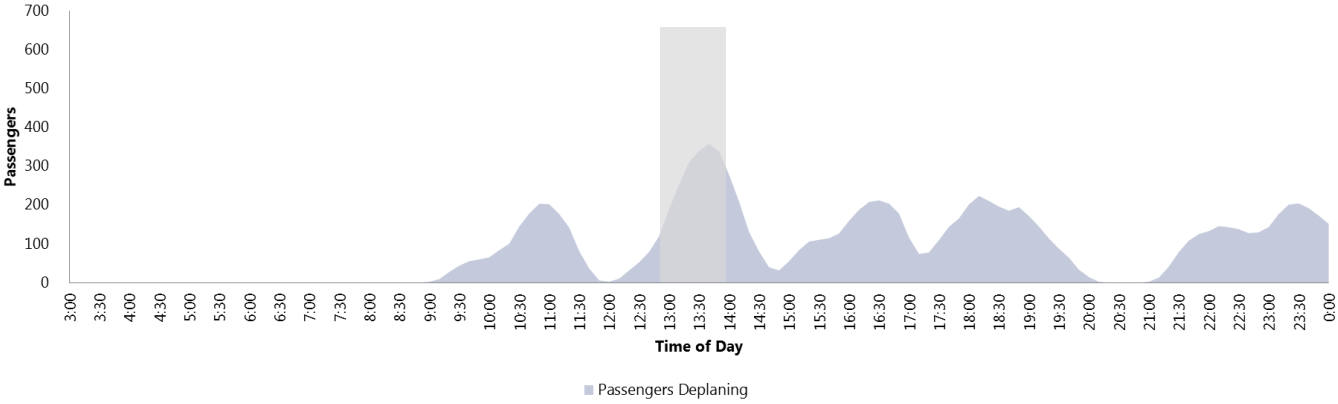


FIGURE B-4
BASELINE (JULY 2016) COMBINED PEAK HOUR PASSENGER ENPLANEMENTS AND DEPLANEMENTS

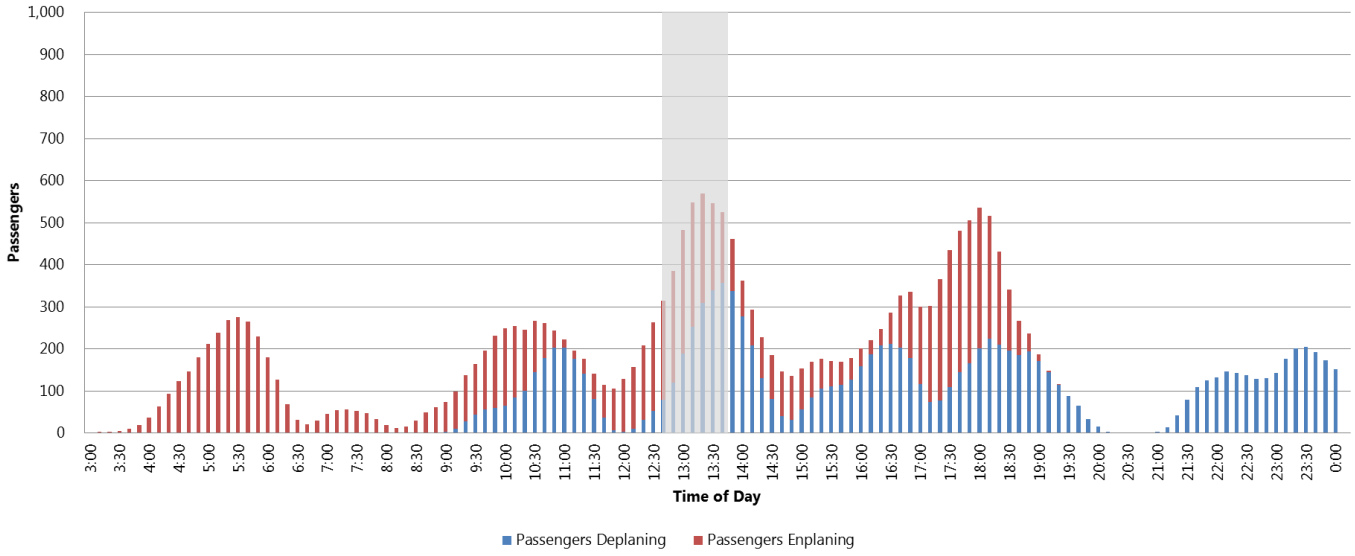


TABLE B-2
2020 FORECAST COMMERCIAL AIRLINE SCHEDULE

Destination	Carrier	Arrives	Departs	Aircraft	Seats
PDX	Alaska Airlines	9:03 AM	9:35 AM	Q-400	76
PDX	Alaska Airlines	1:23 PM	1:58 PM	Q-400	76
PDX	Alaska Airlines	6:10 PM	6:33 PM	Q-400	76
PDX	Alaska Airlines	9:10 PM	5:10 AM	Q-400	76
SEA	Alaska Airlines	12:30 PM	1:02 PM	Q-400	76
SEA	Alaska Airlines	6:28 PM	6:59 PM	Q-400	76
SEA	Alaska Airlines	10:08 PM	6:10 AM	Q-400	76
SEA	Alaska Airlines	11:59 PM	8:00 AM	Q-400	76
SJC	Alaska Airlines	3:36 PM	4:10 PM	Q-400	76
SAN	Alaska Airlines	8:30 PM	6:00 AM	EMB175	76
LAS	Allegiant	10:11 AM	10:51 AM	A320	177
LAX	Allegiant	3:39 PM	6:19 PM	A320	177
IWA	Allegiant	12:44 PM	1:29 PM	A320	177
OAK	Allegiant	4:58 PM	5:43 PM	A320	177
LAX	American Airlines	2:39 PM	3:10 PM	EMB175	76
LAX	American Airlines	9:52 PM	6:30 AM	EMB175	76
PHX	American Airlines	2:00 PM	3:00 PM	EMB175	76
SLC	Delta	11:57 AM	12:34 PM	CRJ/ CRJ7	76
SLC	Delta	10:50 PM	6:15 AM	CRJ/ CRJ7	76
DEN	United	2:38 PM	3:10 PM	EMB175	76
DEN	United	9:03 PM	5:28 AM	A319/ EMB175	102
SFO	United	12:58 PM	2:01 PM	A320/ 738/ 739	165
SFO	United	9:43 AM	10:18 AM	EMB175	76
SFO	United	5:38 PM	6:35 PM	A320/ 739	164
SFO	United	10:51 PM	6:00 AM	A319/ A320	139

2020 Update to Schedule

FIGURE B-5
2020 FORECAST GATE OCCUPANCY

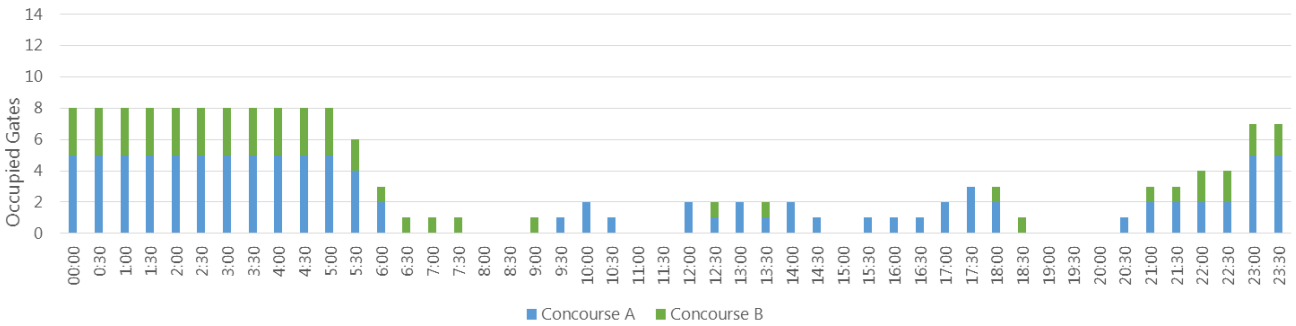


FIGURE B-6
2020 FORECAST PEAK HOUR ENPLANEMENTS

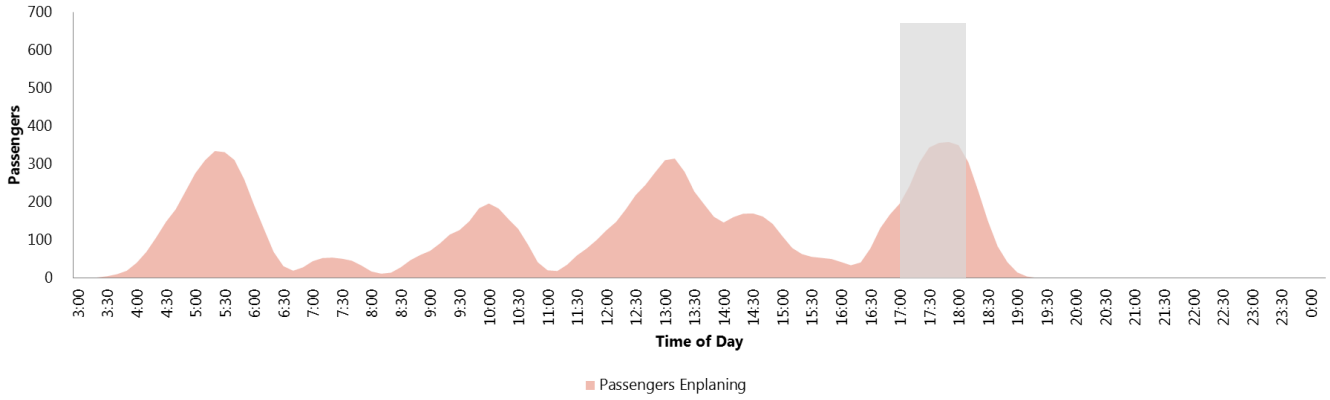


FIGURE B-7
2020 FORECAST PEAK HOUR DEPLANEMENTS

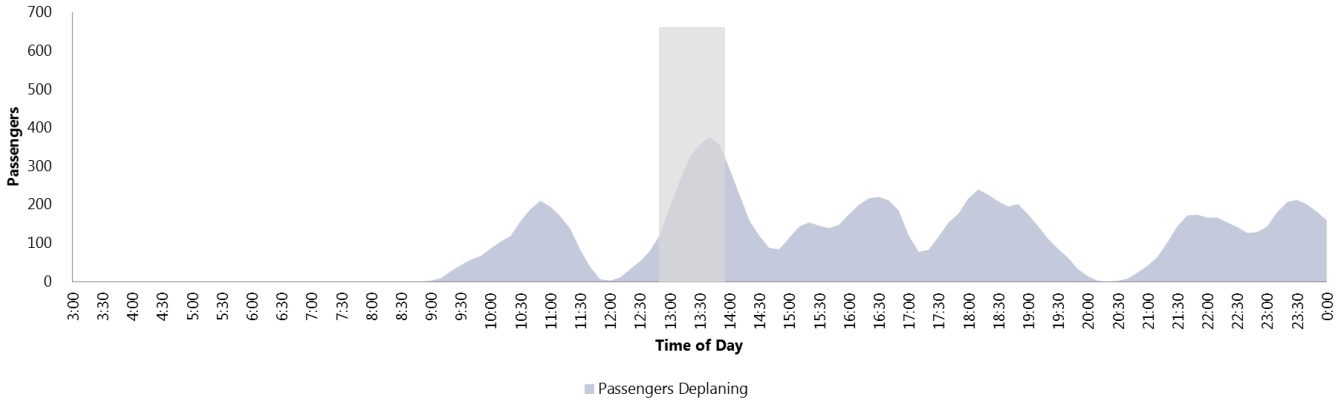


FIGURE B-8
2020 FORECAST COMBINED PEAK HOUR PASSENGER ENPLANEMENTS AND DEPLANEMENTS

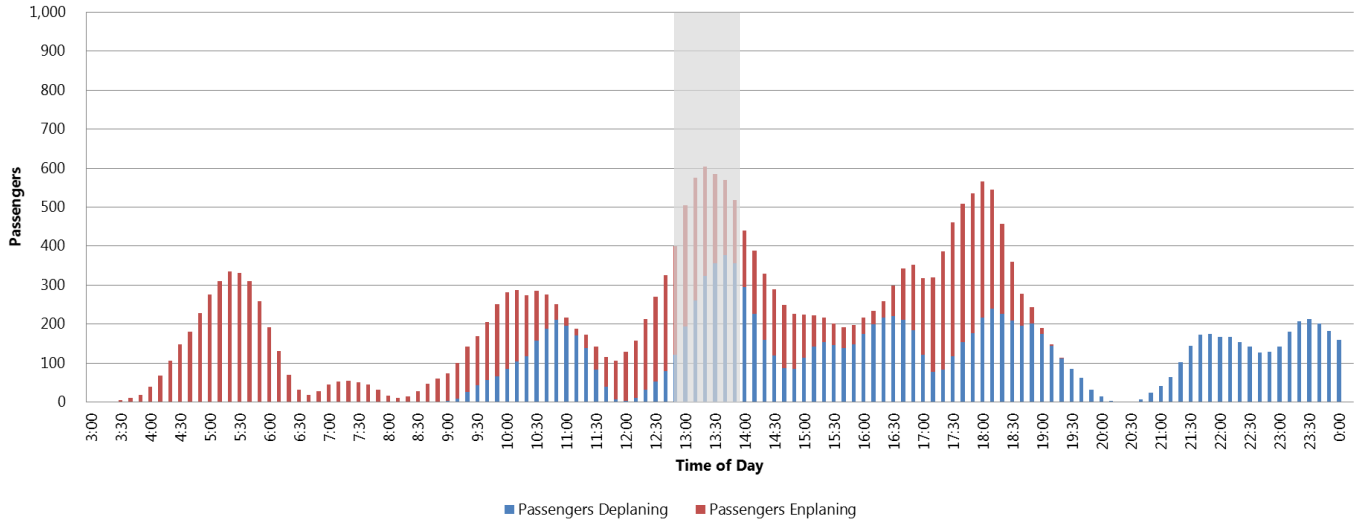


TABLE B-3
2025 FORECAST COMMERCIAL AIRLINE SCHEDULE

Destination	Carrier	Arrives	Departs	Aircraft	Seats
PDX	Alaska Airlines	9:03 AM	9:35 AM	Q-400	76
PDX	Alaska Airlines	1:23 PM	1:58 PM	Q-400	76
PDX	Alaska Airlines	6:10 PM	6:33 PM	Q-400	76
PDX	Alaska Airlines	9:10 PM	5:10 AM	Q-400	76
SEA	Alaska Airlines	12:30 PM	1:02 PM	Q-400	76
SEA	Alaska Airlines	6:28 PM	6:59 PM	Q-400	76
SEA	Alaska Airlines	10:08 PM	6:10 AM	Q-400	76
SEA	Alaska Airlines	11:59 PM	8:00 AM	Q-400	76
SJC	Alaska Airlines	3:36 PM	4:10 PM	Q-400	76
SAN	Alaska Airlines	8:30 PM	6:00 AM	EMB175	76
LAS	Allegiant	10:11 AM	10:51 AM	A320	177
LAS	Allegiant	10:11 AM	10:51 AM	A320	177
LAX	Allegiant	3:39 PM	6:19 PM	A320	177
IWA	Allegiant	12:44 PM	1:29 PM	A320	177
OAK	Allegiant	4:58 PM	5:43 PM	A320	177
LAX	American Airlines	2:39 PM	3:10 PM	EMB175	76
LAX	American Airlines	9:52 PM	6:30 AM	EMB175	76
PHX	American Airlines	2:00 PM	3:00 PM	A320/ 738	165
SLC	Delta	11:57 AM	12:34 PM	CRJ/ CRJ7	76
SLC	Delta	10:50 PM	6:15 AM	CRJ/ CRJ7	76
DEN	United	2:38 PM	3:10 PM	EMB175	76
DEN	United	9:03 PM	5:28 AM	A319/ EMB175	102
SFO	United	12:58 PM	2:01 PM	A320/ 738/ 739	165
SFO	United	9:43 AM	10:18 AM	EMB175	76
SFO	United	5:38 PM	6:35 PM	A320/ 739	164
SFO	United	10:51 PM	6:00 AM	A319/ A320	139
ORD	United	10:30 PM	7:30 AM	EMB175	76

2020 Update to Schedule
2025 Update to Schedule

FIGURE B-9
2025 FORECAST GATE OCCUPANCY

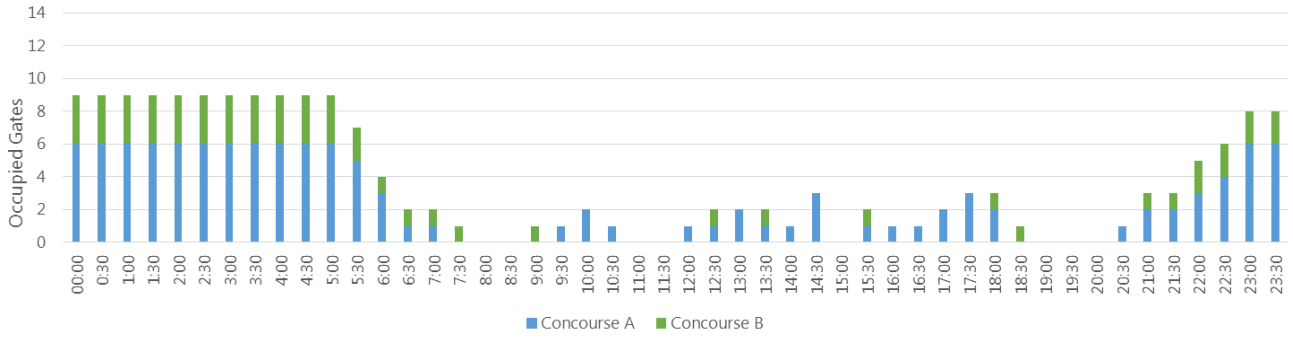


FIGURE B-10
2025 FORECAST PEAK HOUR ENPLANEMENTS

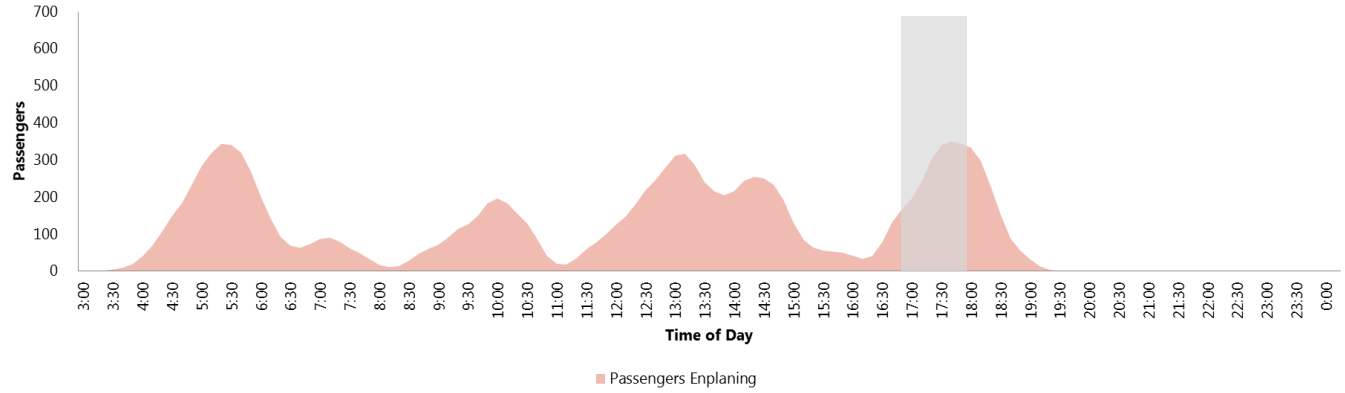


FIGURE B-11
2025 FORECAST PEAK HOUR DEPLANEMENTS

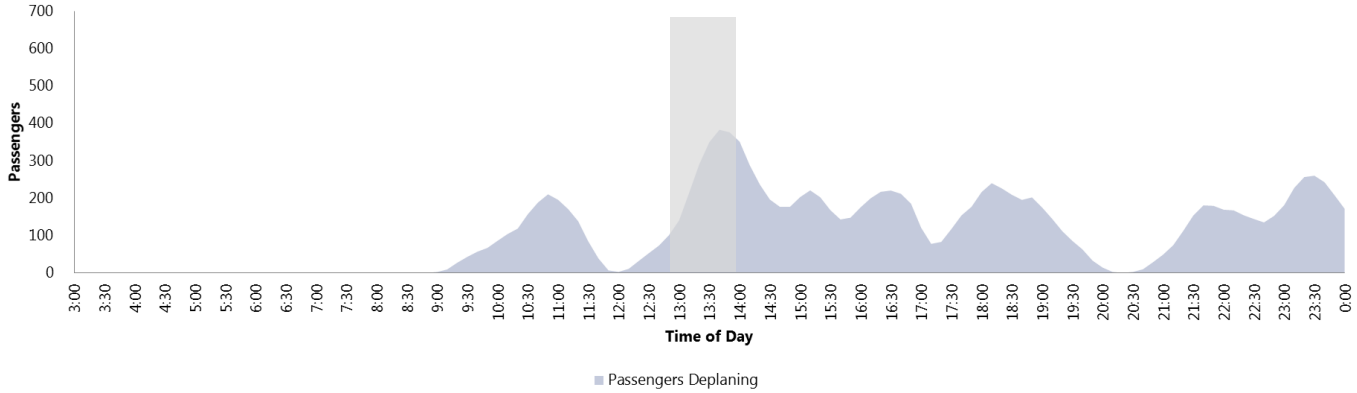


FIGURE B-12
2025 FORECAST COMBINED PEAK HOUR ENPLANEMENTS AND DEPLANEMENTS

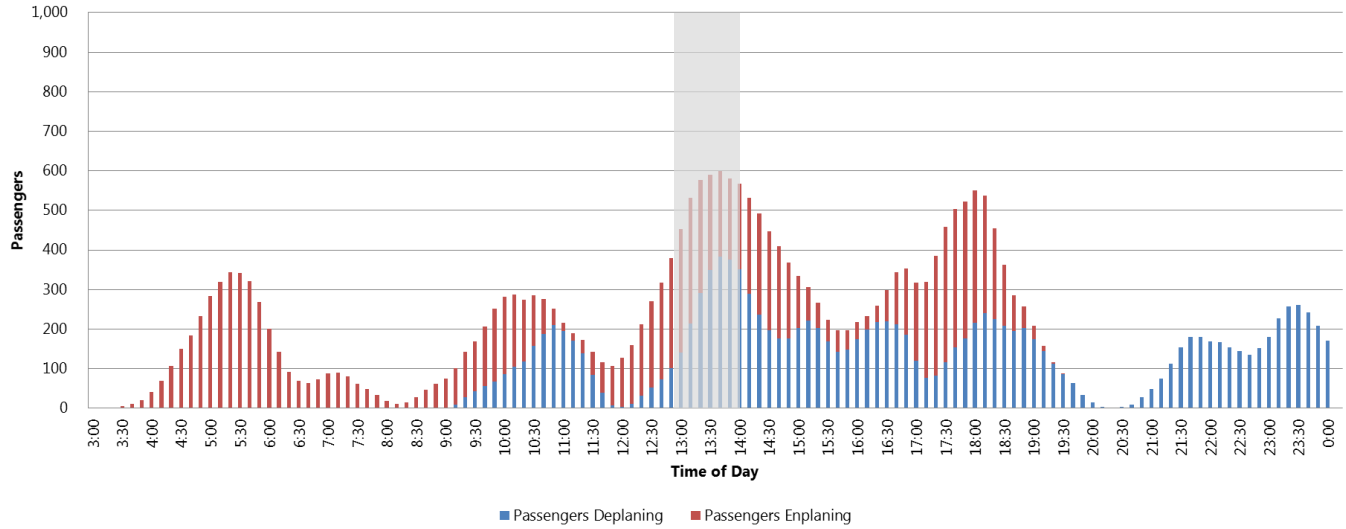


TABLE B-4
2035 FORECAST COMMERCIAL AIRLINE SCHEDULE

Destination	Carrier	Arrives	Departs	Aircraft	Seats
PDX	Alaska Airlines	9:03 AM	9:35 AM	Q-400	76
PDX	Alaska Airlines	1:23 PM	1:58 PM	Q-400	76
PDX	Alaska Airlines	6:10 PM	6:33 PM	Q-400	76
PDX	Alaska Airlines	9:10 PM	5:10 AM	Q-400	76
SEA	Alaska Airlines	12:30 PM	1:02 PM	Q-400	76
SEA	Alaska Airlines	6:28 PM	6:59 PM	Q-400	76
SEA	Alaska Airlines	10:08 PM	6:10 AM	Q-400	76
SEA	Alaska Airlines	11:59 PM	8:00 AM	Q-400	76
SJC	Alaska Airlines	3:36 PM	4:10 PM	Q-400	76
SAN	Alaska Airlines	8:30 PM	6:00 AM	EMB175	76
LAS	Allegiant	10:11 AM	10:51 AM	A320	177
LAS	Allegiant	10:11 AM	10:51 AM	A320	177
LAX	Allegiant	3:39 PM	6:19 PM	A320	177
IWA	Allegiant	12:44 PM	1:29 PM	A320	177
OAK	Allegiant	4:58 PM	5:43 PM	EMB175	76
LAX	American Airlines	2:39 PM	3:10 PM	EMB175	76
LAX	American Airlines	9:52 PM	6:30 AM	EMB175	76
LAX	American Airlines	11:57 AM	12:34 PM	737-7 MAX	170
PHX	American Airlines	2:00 PM	3:00 PM	A320/ 738	165
PHX	American Airlines	11:00 PM	6:30 AM	EMB 175	76
SLC	Delta	11:57 AM	12:34 PM	CRJ/ CRJ7	76
SLC	Delta	10:50 PM	6:15 AM	CRJ/ CRJ7	76
MSP	Delta	10:00 PM	7:00 AM	EMB175	76
DEN	United	2:38 PM	3:10 PM	EMB175	76
DEN	United	9:03 PM	5:28 AM	A319/ EMB175	102
SFO	United	12:58 PM	2:01 PM	A320/ 738/ 739	165
SFO	United	9:43 AM	10:18 AM	EMB175	76
SFO	United	5:38 PM	6:35 PM	A320/ 739	164
SFO	United	10:51 PM	6:00 AM	A319/ A320	139
SFO	United	11:15 PM	6:40 AM	EMB175	76
ORD	United	10:30 PM	7:30 AM	A320	150

2020 Update to Schedule
2025 Update to Schedule
2035 Update to Schedule

FIGURE B-13
2035 FORECAST GATE OCCUPANCY

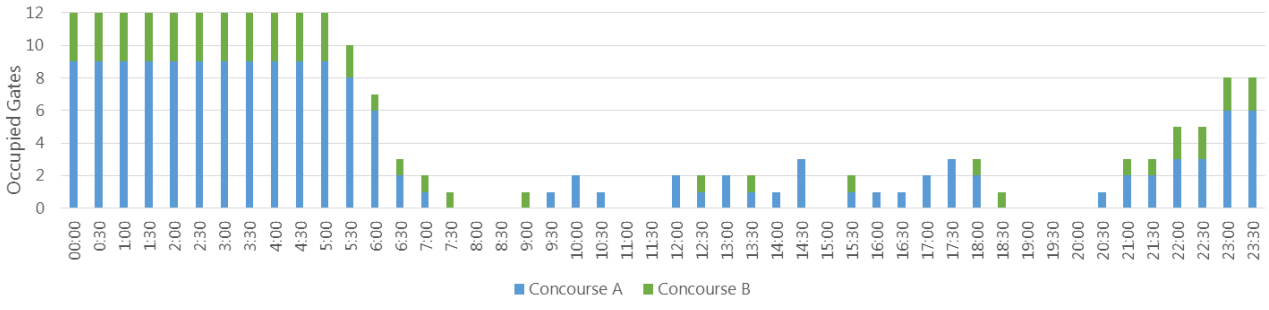


FIGURE B-14
2035 FORECAST PEAK HOUR ENPLANEMENTS

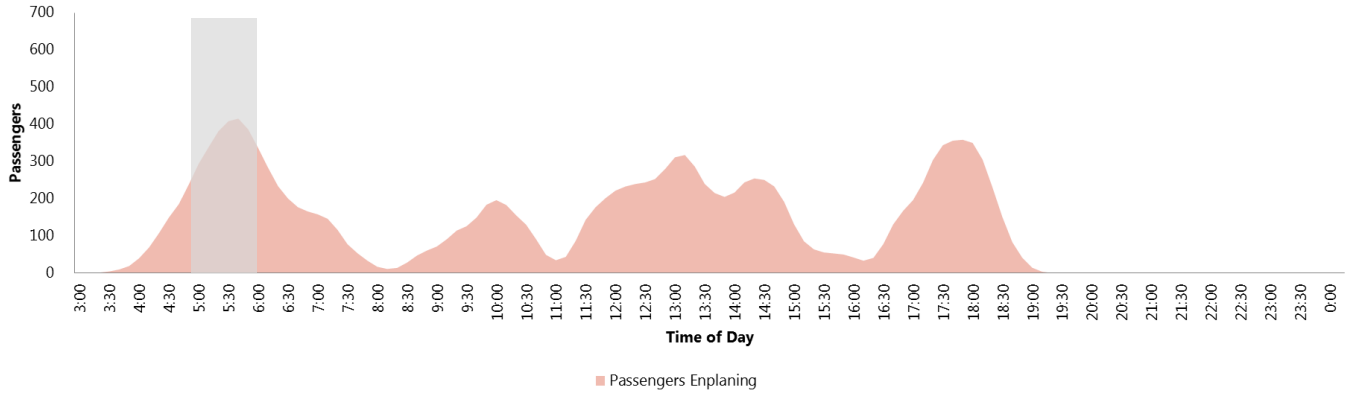


FIGURE B-15
2035 FORECAST PEAK HOUR DEPLANEMENTS

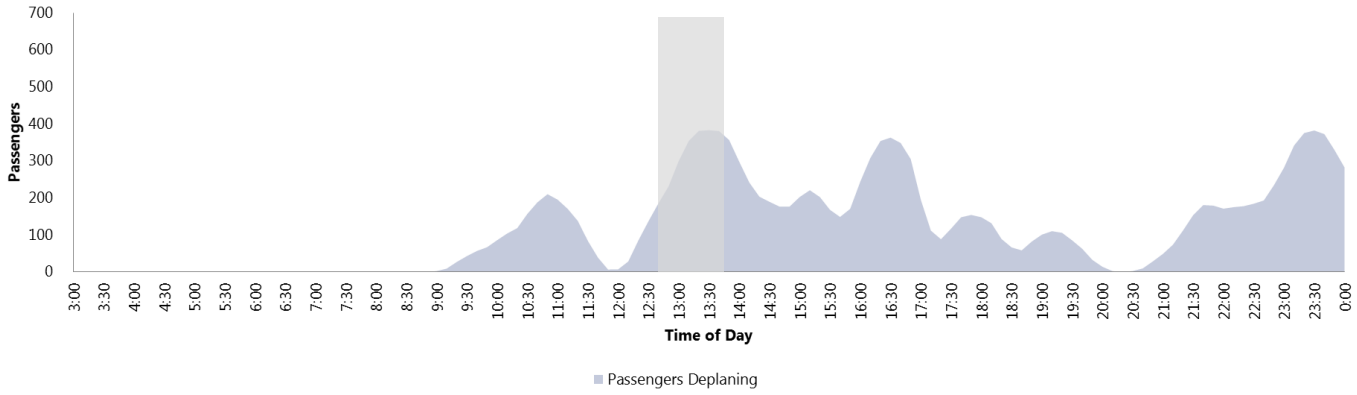


FIGURE B-16
2035 FORECAST COMBINED PEAK HOUR ENPLANEMENTS AND DEPLANEMENTS